MARCH 1951

The Paper Industry

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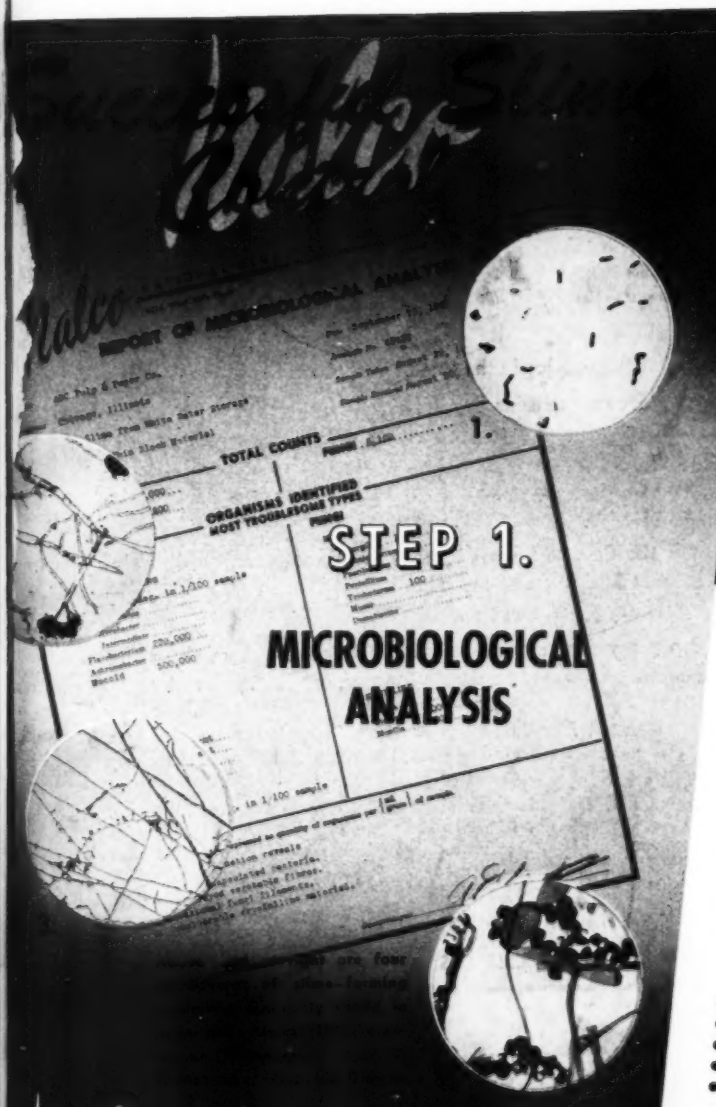

THE Nalco-developed method of identification of slime-forming organisms is the important first step in the Nalco System of *successful* slime control. Nalco experts collect samples at proper points throughout your mill. These samples are analyzed in the Nalco Laboratories, where the finest equipment and scientific skill insure correct reports. Analysis reports provide a firm base upon which to recommend effective, economical slimicide treatment.

Where bacterial conditions change with the seasons, or vary due to local conditions, routine Nalco microbiological analyses detect these changes and point the way to successful year-around slime control.

The complete Nalco System, outlined below, can be put to work in your mill on short notice to provide continuing, successful slime control. Write for details today.

The Nalco System of Slime Control

- Microbiological Survey.
- Engineering Survey.
- Chemical Survey.
- Selection and application of treatment.
- Regular service calls, routine analyses, and mill checks.

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6232 W. 66th Place • Chicago 38, Illinois

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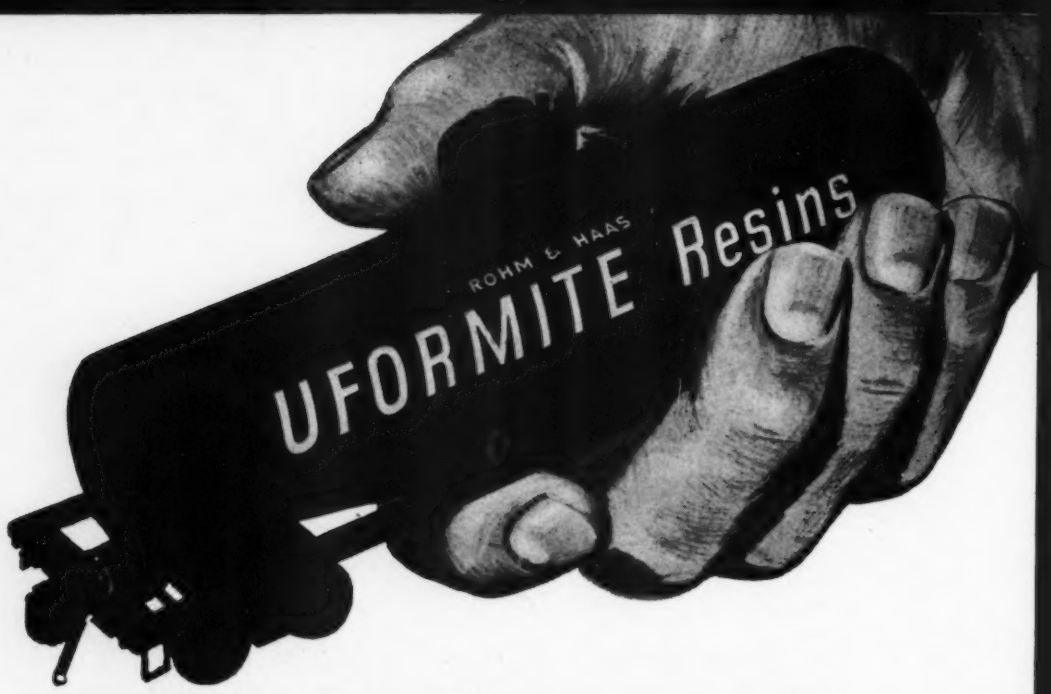

Now . . . Buy Wet Strength in the "Large Economy-Size Package"

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RHOZYME BB and RHOZYME E-S—for enzyme conversion of starch.

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HYAMINE Deodorants and Bactericides —for paperboard and glue.

UFORMITE, RHOZYME, TAMOL, TRITON, HYAMINE are trade-marks, Reg. U.S. Pat. Off. and in principal foreign countries.

Full technical information on the UFORMITE resins is yours for the asking.

Here's an *extra* saving in the cost of wet-strengthening your paper.

Buying UFORMITE resins in tank-car quantities cuts to the bone the cost of these easy-to-use wet-strength agents—brings added economy in plant handling, too. UFORMITE resins are stable—made to order for bulk handling. They require no special equipment or process change.

Now is the time to take advantage of this wet-strength bargain. As little as $4 per ton of paper boosts wet Mullen values 300%—improves dry physicals, too.

To meet *any* wet-strength requirement, choose from these two time-tested resins, both suitable for tank-car shipment:

UFORMITE 467 (anionic type) provides efficient, low-cost wet-strength in unbleached Kraft, bag stock, and similar furnishes. Particularly suitable for beater addition.

UFORMITE 471 (cationic type) is suitable for all types of furnishes, including Kraft, bleached sulfite, groundwood. Substantivity to cellulose permits addition at any convenient point—from beater to head box.

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There are as many yardsticks to measure bronze valve quality as there are service applications. Each job has its own standard — and that's why it's important to know the basic facts behind the selection of valve metals. The new research brochure on "Lunkenheimer Copper-Base Alloys" will help you understand how and why valve bronzes are chosen for specific services. It will help *you* measure bronze valve quality for your own specific applications.

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*Patented Alloy

Lunkenheimer Figure 2125 Bronze Valves cut your maintenance costs in many ways. Three basic designs, all in the 125 lb. class, have interchangeable bodies and parts to simplify your stock room problems. Check the cross sectional views on this page, and ask your distributor or write us direct for Circular 566, describing them in detail.

Write for copies of the research brochure on Copper-Base Alloys to The Lunkenheimer Co., P.O. Box 360-S, Cincinnati 14, Ohio.

Figure 2125
Double-Wedge Disc
Rising Stem

Figure 2127
Solid-Wedge Disc
Rising Stem

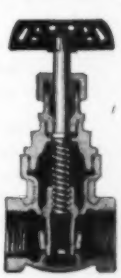

Figure 2129
Single-Wedge Disc
Non-Rising Stem

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LUNKENHEIMER

THE ONE *Great* NAME IN VALVES

L-251-B

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The Paper Industry

Technology • Engineering • Management • Production

VOLUME 32 • NUMBER 12 • MARCH, 1951

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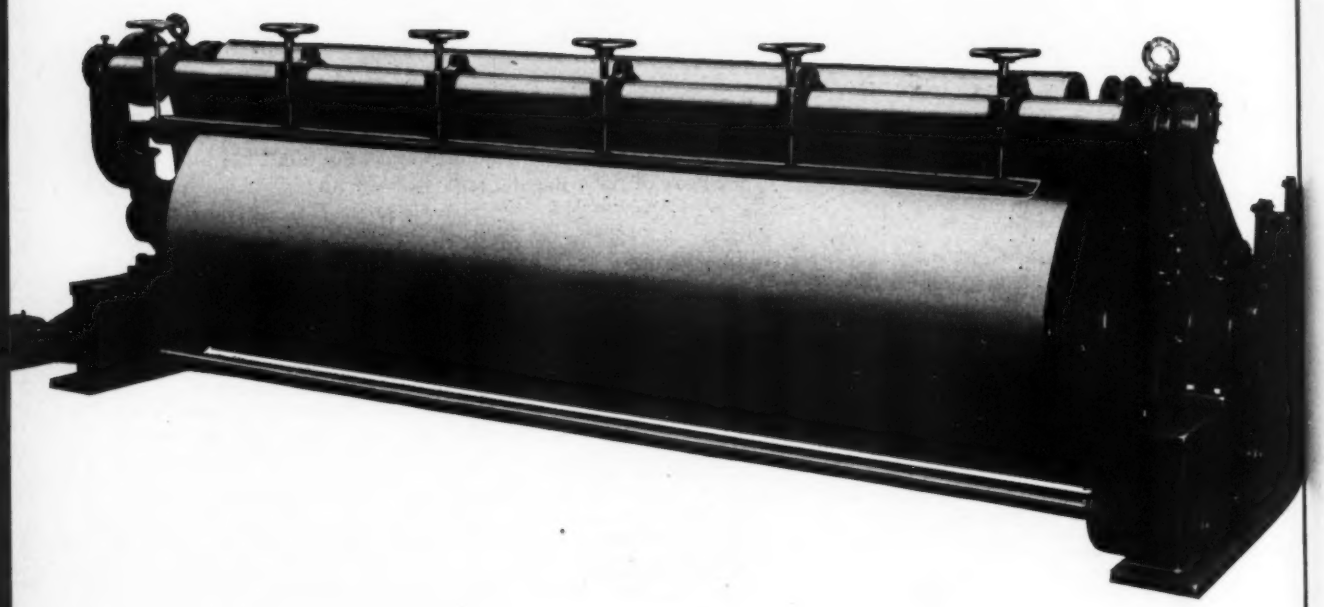
When in need of a reel or any other paper mill equipment, write us. We'll gladly give you the benefit of our more than eighty years' experience in paper mill machinery manufacture.



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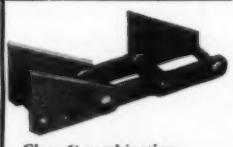

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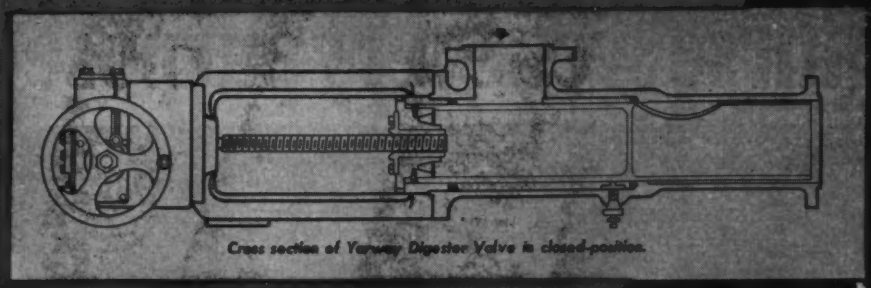

Cross section of Yarway Digester Valve in closed position.

COOSA RIVER *Uses*

YARWAY SEATLESS DIGESTER BLOW VALVES FOR...

- TIGHT SHUT-OFF
- FREE DISCHARGE
- LOW MAINTENANCE
- FAST OPERATION
- REMOTE CONTROL

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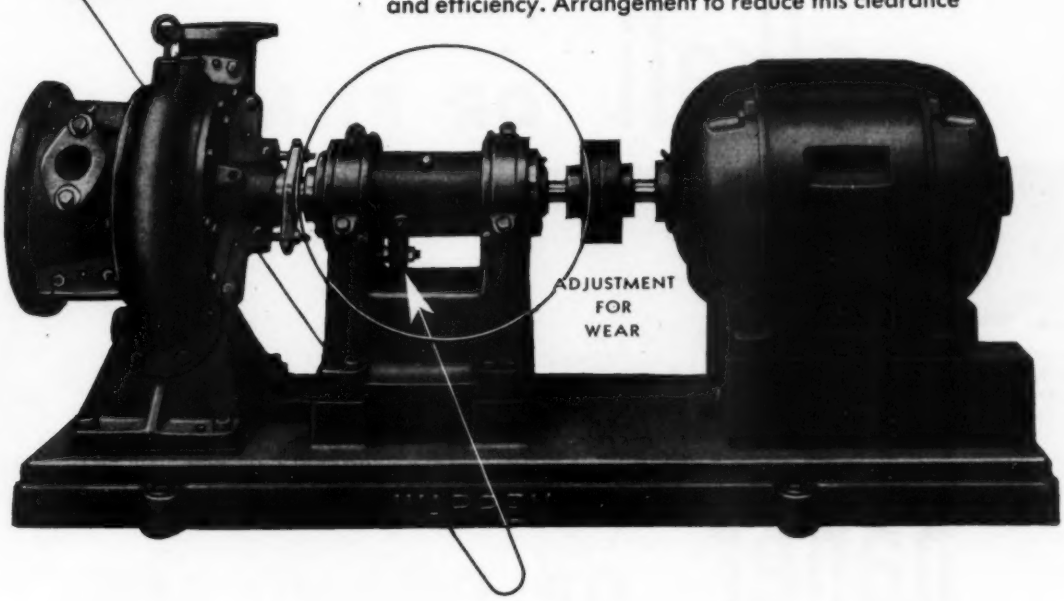

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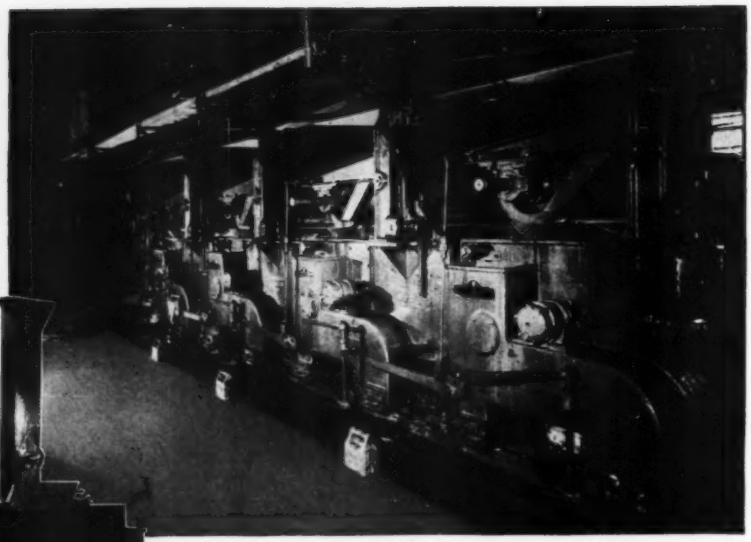

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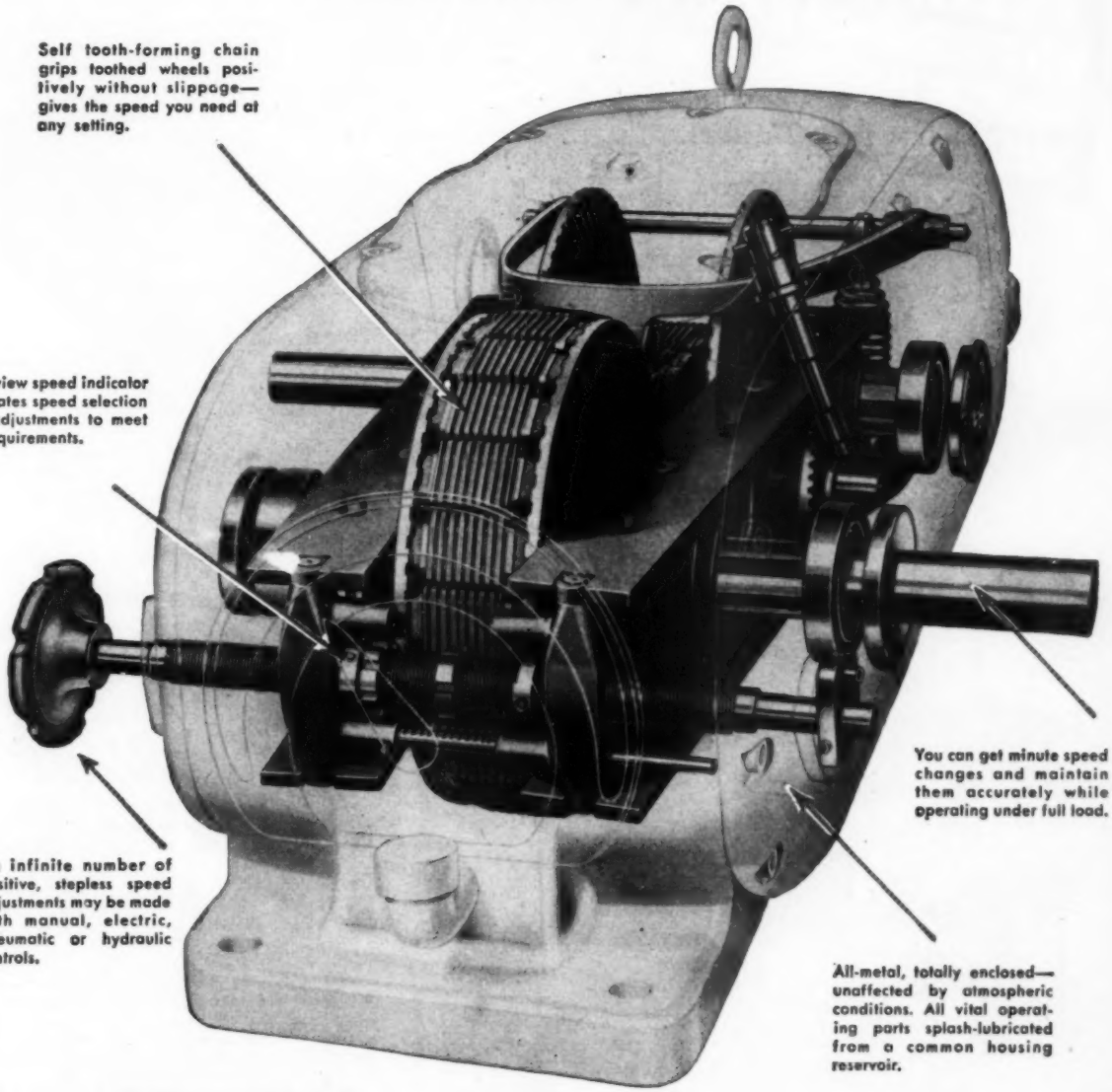
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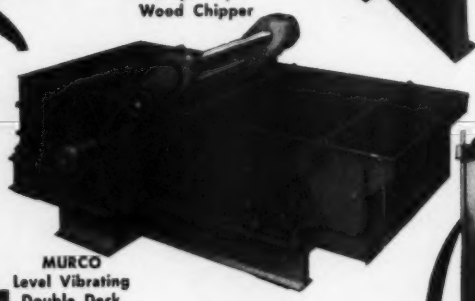
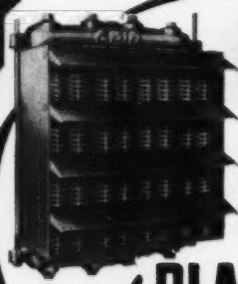


MURCO Level Vibrating Double Deck Chip Screen



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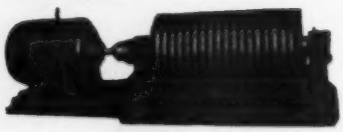

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Stainless Steel Pipes and Fittings

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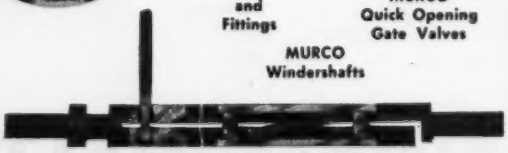

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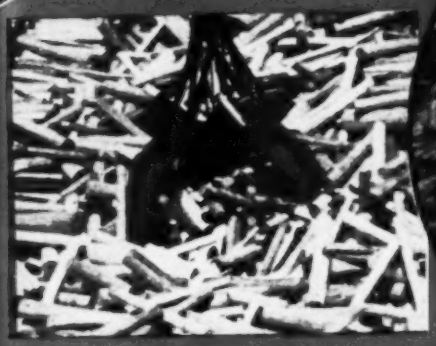

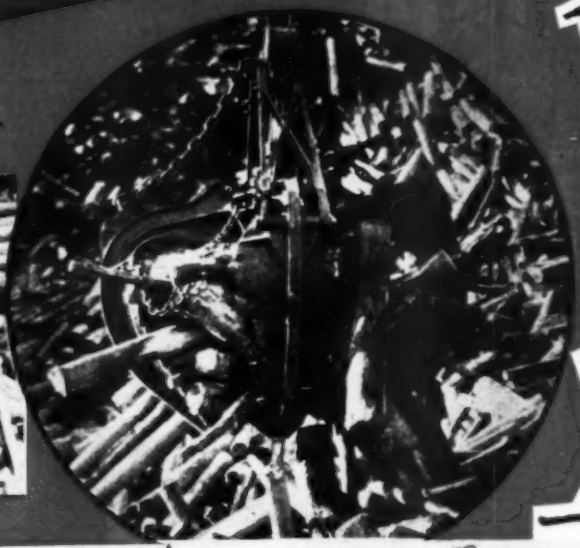

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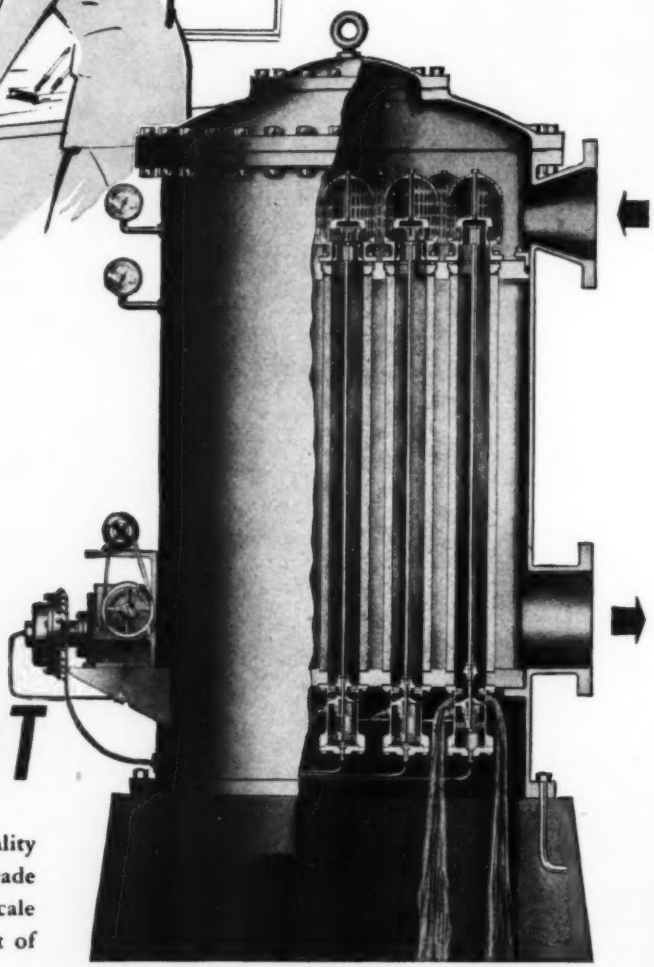

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In kraft or tissue, book or newsprint—water quality is as critical as chip quality. No matter what grade of pulp or paper you make, sand, grit and pipe scale are expensive when they keep your product out of the top price brackets.

Water filtration with the fully automatic Adams Poro-Screen or Poro-Stone Filter takes out price-lowering impurities *before* they become part of the stock. Continuous backwashing effectively prevents clogging of filter elements—avoids costly, cumbersome cleaning operations.

Remember—in its early stages your product is about 98% water, and most water-borne impurities stay with the stock.

Find out what Adams filtration has done in situations like yours. Write for the new 20 page booklet on water filtration in the Pulp and Paper Industry, Bulletin No. 691.

R. P. ADAMS COMPANY, INC.

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"Piping by Midwest" means the very best in piping at lower completed cost. Being accurate in dimension and alignment, Midwest subassemblies are easy to erect . . . difficult operations are performed in our fabricating plants and field work is simplified. When desired, Midwest will also erect the piping with undivided responsibility. You will find it to your advantage to call on Midwest whenever you need piping.

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An old chest may be made as clean and shining as this with *Kalamazoo* tile lining.

● **SMOOTH SURFACES** Unusually free-flowing, easily cleaned, not affected by ordinary stock fluids.

● **EXTRA STRONG** *Kalamazoo* Tile Tanks may be designed for any load or pressure or even as part of building.

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● **ECONOMICAL** For most installations, *Kalamazoo* Tile Tanks cost no more than reinforced concrete, last far longer.

● **MINIMUM MAINTENANCE** No chipped concrete to repair, no slime to remove, no rusted metal, no tightening of hoops.

● **"PIONEER" CONSTRUCTION** Over 20 years ago *Kalamazoo* engineers pioneered in designing and building vitrified glazed tile tanks — the standard of quality today in the paper industry.

Kalamazoo tile is made in all shapes necessary for original construction or conversion of any type tank, chest, or storage building. A single contract covers _Kalamazoo_ engineering and construction service, giving you the protection of undivided responsibility. On any tank problem, write or call _Kalamazoo_ first.

Cylindrical *Kalamazoo* tile tank.

Kalamazoo Tile circulating chest ready for installation of concrete cover slab for support of equipment.

Kalamazoo TANK and SILO COMPANY

327 HARRISON STREET • KALAMAZOO, MICHIGAN

Whirling knives . . . shocking impact as huge logs hit the disk . . . terrific load as they reduce to chips in seconds . . . this is chipper duty—the toughest assignment any synchronous motor has to face. And this is why tough E-M Synchronous Motors are heavily favored by the paper industry for its chipper drives.

The 1500 hp E-M Synchronous Motor driving the 15 ft. diam. six-knife chipper at the new H. R. MacMillan Export Co., Ltd., Pulp Mill near Nanaimo, British Columbia, is typical of the E-M line of Synchronous Motors specially designed and constructed for chipper duty. Cast steel rotor; heavy, flared back plates; massive box type frame; high thermal capacity cage windings; extra strong coil-end lashings—these E-M features enable the motor to take shocks and tremendous loads with ease and continue to deliver steady, dependable power.

E-M Induction Motor drives pump for hydraulic barking. Also featured in this new mill is the 1250 hp, 3580 rpm E-M Heavy-Duty Induction Motor driving the centrifugal pump which furnishes high pressure water for the hydraulic barker. The same E-M quality engineering insures that this motor, too, will continue to produce steady, dependable drive power so necessary to pulp production. Coils are extra tough and are treated with a special varnish; coil ends are lashed tightly to each other and to rigid bracing rings to prevent movement; the rotor is built especially strong and stiff; the shaft has extra strength.

These motors were built by E-M engineers who thoroughly understand the drive problems of the paper industry and who have been manufacturing motors for pulp and paper mill drives for many years.

For help on your paper mill drives, call the E-M engineer nearest you, or consult the factory. Write for Synchronizer No. 26, the Paper Industry number.

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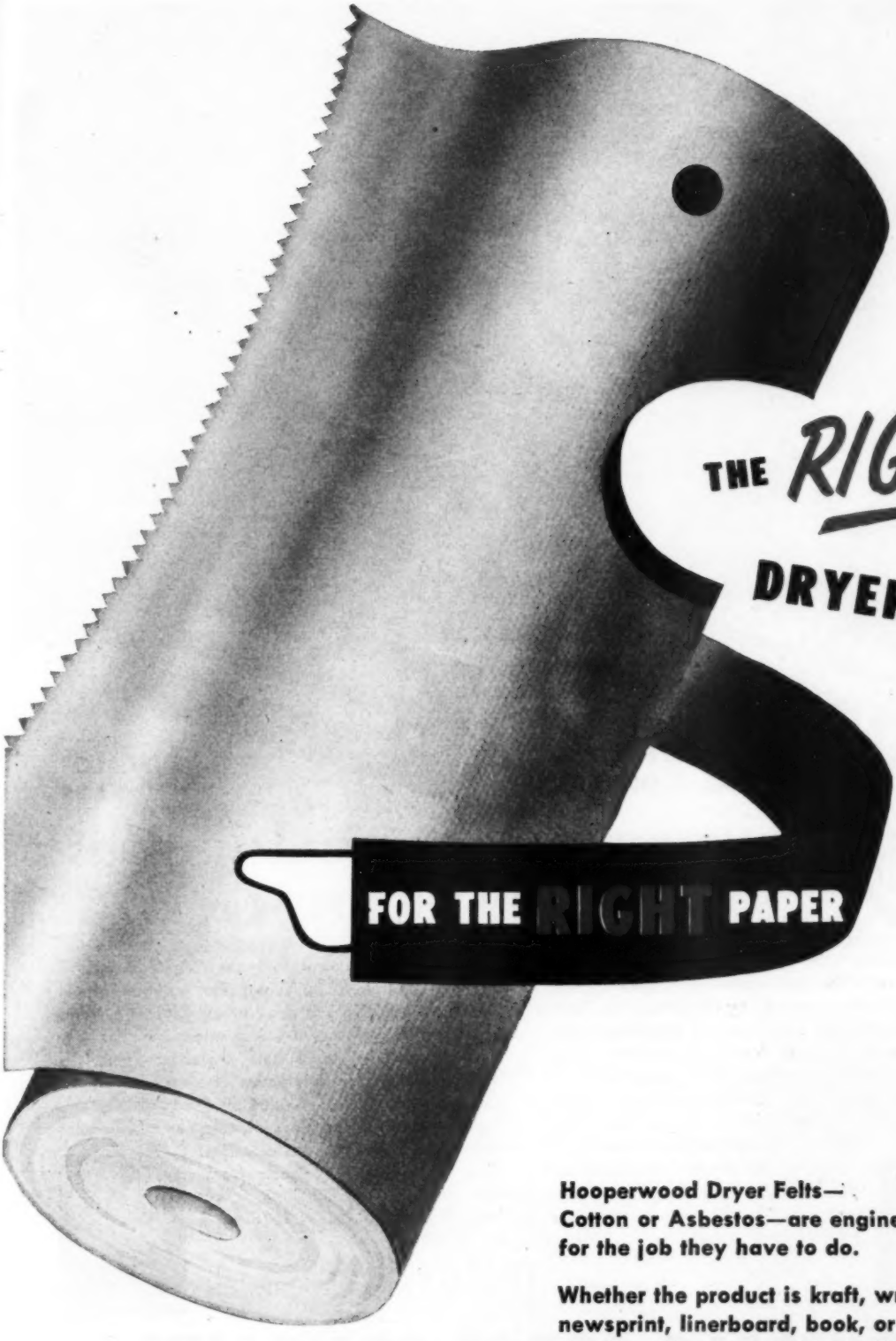

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Cotton or Asbestos—are engineered
for the job they have to do.

Whether the product is kraft, writing,
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there's a Hooperwood Dryer Felt
made just for that job.

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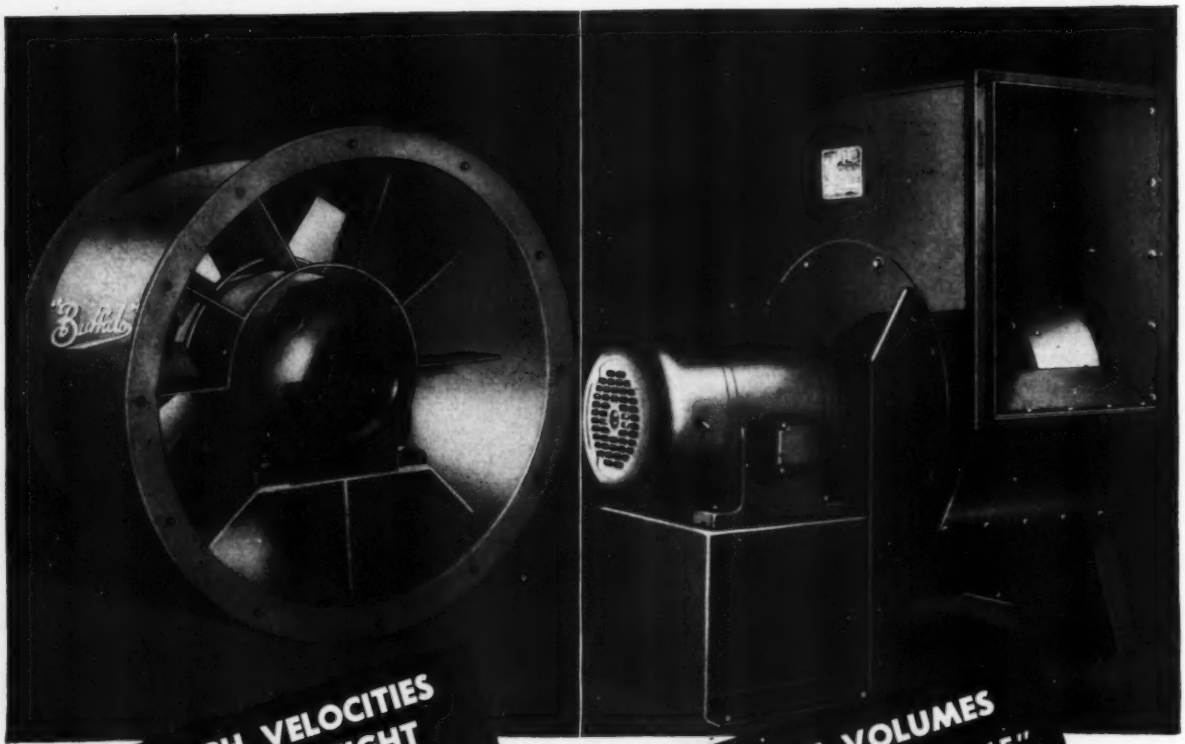

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• LIGHT WEIGHT
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. . . "BUFFALO"
AXIAL FLOW FANS

• HIGH VOLUMES
• PRESSURES TO 15"

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"LL" FANS

"Buffalo" GIVES YOU YOUR CHOICE FOR BEST RESULTS ON THE JOB!

"Buffalo" builds both Axial Flow and Centrifugal Fans because ONE type alone can't give EVERY characteristic without sacrificing efficiency. "Buffalo" Axial Flows give you the compact, lightweight design so desirable in those "cramped quarters" jobs. Their efficiencies are very high where static pressures are not much above 1½" and duct connections are straight. "Buffalo" does build axials for high pressures on special installations—where space is the major consideration. WRITE FOR BULLETIN 3533-C for complete facts and comparative performance curves.

Generally, if you want to move large volumes of air, the "Buffalo" Limit-Load Fan is your logical choice. It will give you good efficiencies on systems of fairly high pressure, and even where installed near duct curves. Like the "Buffalo" Axial Flow Fan, it is non-overloading so that motor size may be picked close to capacity rating—and all wheels are dynamically balanced for exceptionally smooth, quiet delivery. Closely graduated sizes give you a range of choice from 600 cfm, to over 500,000 cfm. WRITE FOR BULLETIN 3675.

"Buffalo" FIRST FOR FANS

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"Tight Squeeze All Around!"

Supplying unprecedented customer demands in the face of many raw material shortages is today's big challenge to the Chemical Industry. A "tight squeeze" is being felt all around, and each producer is working hard to overcome his particular part of the problem.

In the field of heavy chemicals, for example, lack of sulfur has meant curtailments in production of Sulfuric Acid and other important industrial chemicals made from it. As a major producer, General Chemical is using every possible tool to make increased tonnages available. Equipment is being converted to the use of sulfur-bearing ores, gases, and other alternate raw materials—all with the view to serving customers as efficiently as possible.

And this is but one of the problems that must be met by General—and by the Industry as a whole.

They will, too!

The same hard-driving effort, the ingenuity, and the close teamwork that have whipped so many tough problems in the past will do so again.

You can count on it!

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How and Where?

...Ross answers today's 2 big questions about heat exchangers

As all of us get deeper and deeper into the defense program, the questions "how" and "where" will obviously become more important and more frequent.

Today's the time, we think, to give you *our* answer to these vital questions, with respect to heat exchanger procurement. And we aim to make it a helpful answer . . . one that will accomplish the most good for all of us.

HERE'S WHAT WE CAN PROMISE . . . *DEFINITELY!* Ross can take over *your* problems *faster* . . . saving much of *your* time. As the pioneer and most advanced in heat exchanger standardization, Ross has the engineering know-how and the plant facilities to get your job going *sooner* . . . the knowledge and the skill to do it *better!* This applies to all types of heat transfer and allied equipment—exchangers, surface condensers, steam jet vacuum equipment—either fabricated from stock parts and standardized designs, or specially engineered from the ground up. And it applies to every phase of today's domestic and military needs—paper • chemicals • plastics • power • synthetic rubber • powder • petroleum • metals—the same as it applies to fighting vessels • cargo ships • trucks—

Yes, our answer to "how" and "where" is "HERE"! For, no matter what your problem or application, Ross is a ready source of time-saving methods!

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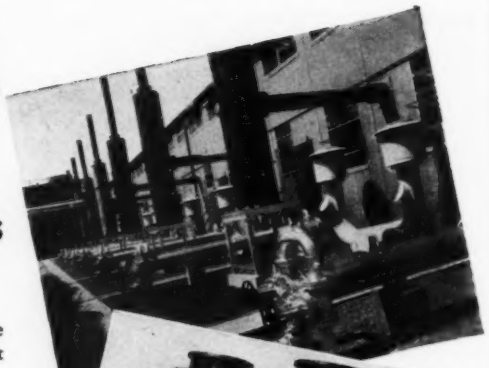
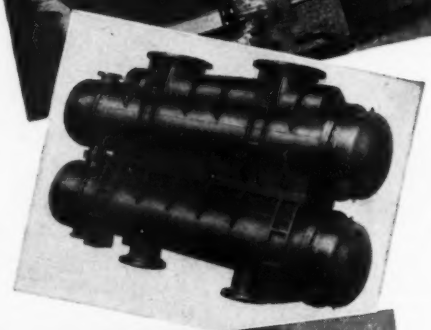
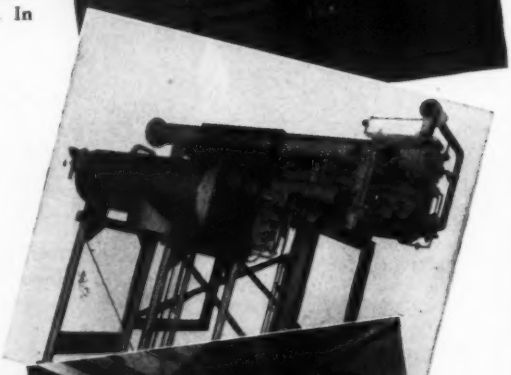
BUILT TO T. E. M. A. STANDARDS As a member of the Tubular Exchanger Manufacturers Assn., Ross fabricates in accordance with the published thermal and mechanical standards of T. E. M. A.







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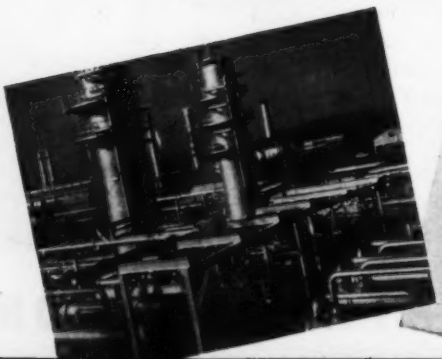

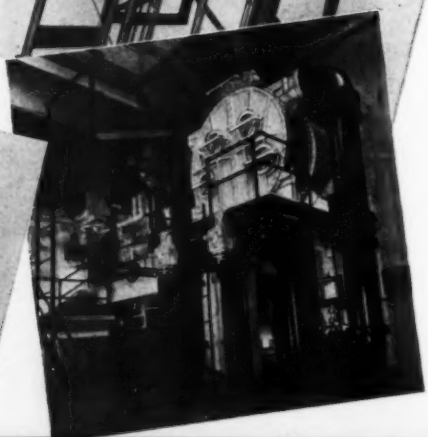

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You can be sure of smooth running machines with
TENAX FELTS.
Tenax Felts, designed especially to suit your paper making machines, assure you of the best possible operation. They help you to produce your paper with efficiency and economy.
LOCKPORT FELT CO. · NEWFANE, N. Y.
TENAX FELTS

It's time we got *working* mad!

As we listen to the latest insults from Moscow, we're likely to get fighting mad.

Instead, we'd better use our heads and get *working* mad.

It is clear by now that Stalin and his gang respect just one thing—strength. Behind the Iron Curtain they've been building a huge fighting machine while we were reducing ours. Now we must rebuild our defenses—*fast.*

As things stand today, there is just *one* way to prevent World War III. That is to re-arm—to become strong—and to stay that way!

This calls for better productivity all along the line. Not just in making guns, tanks and planes, but in turning out civilian goods, too.

Arms must come first. But we must produce arms *at the same time* we produce civilian goods.

We can do this double job if we all work together to turn out more for every hour we work—if we use our ingenuity to step up productivity.

All of us must now make sacrifices for the common good. But we're working for the biggest reward of all —*peace with freedom!*

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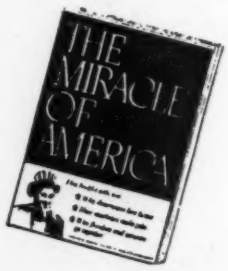
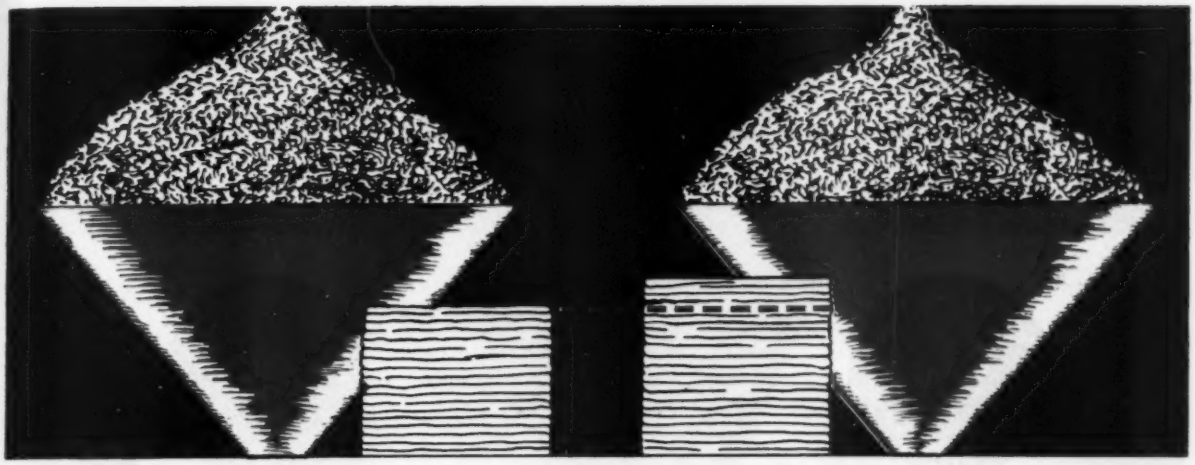


The PAPER INDUSTRY



When the chips are down

you get 20% more pulp with Sutherland

More and more mills making kraft, sulphite, and semi-chemical pulps are improving their competitive position in the industry by installing Sutherland High Yield Systems. In addition to guaranteeing a 20% increase in yield, these new techniques provide other substantial savings in chemicals, power, and steam. At present prices, the total savings amount to about $6.00 per ton of pulp, and this figure will increase with the rising trend of the market.

It's going to be harder and harder for mills to show a profit if they use "Model T" pulping methods. You can improve your pulps and your profits with the streamlined Sutherland High Yield System. Let us tell you how. Write for further information, mentioning the kind of pulp you're interested in.

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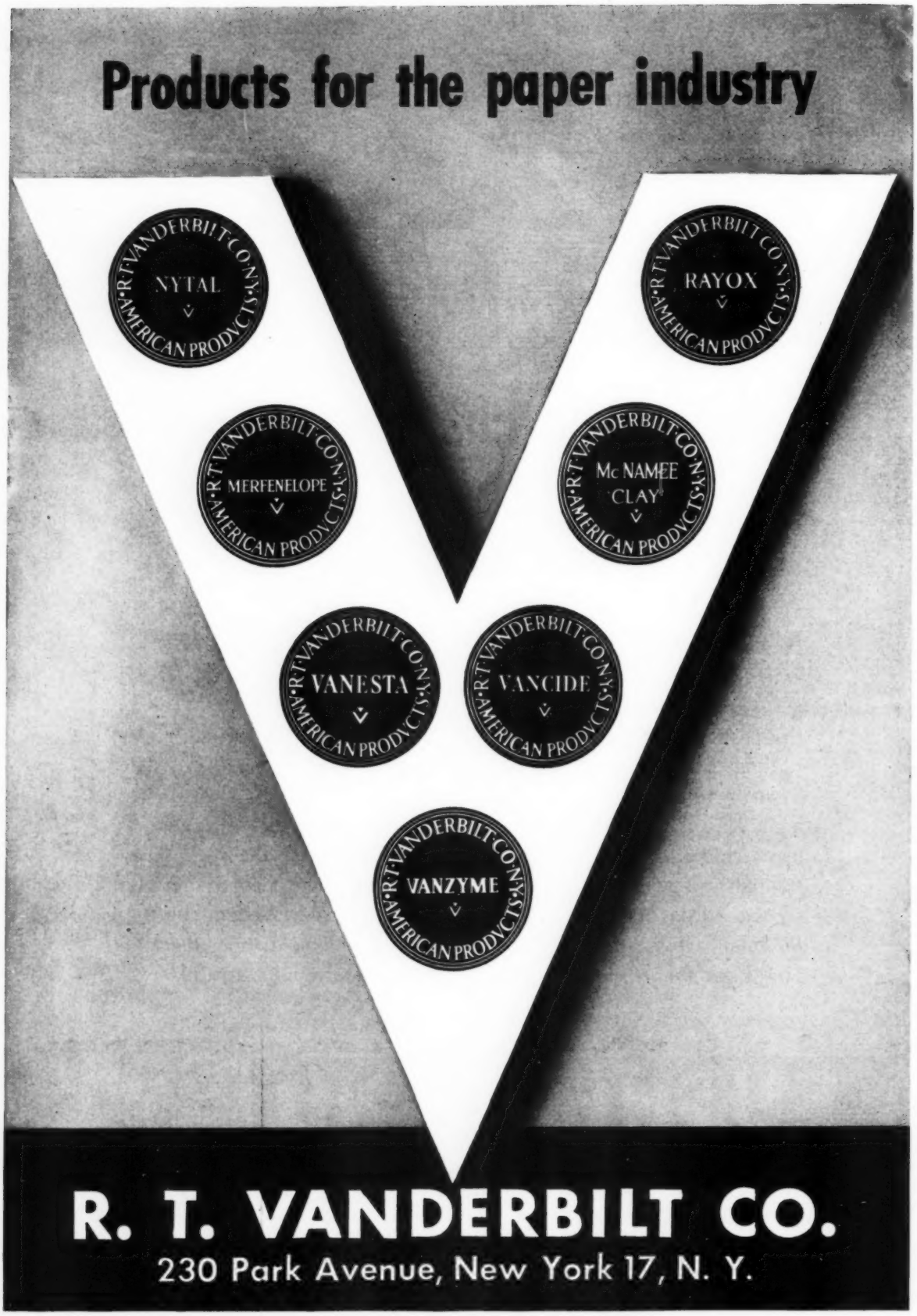
Products for the paper industry



R. T. VANDERBILT CO.

230 Park Avenue, New York 17, N. Y.

The Paper Industry

March 1951

"Mobilize for Defense"

"Mobilize for Defense" is more than a slogan. It means there is a job ahead for national government, local government, industry, the home, and *every individual*, that will require unstinting and unselfish effort. There is an agency—the only national welfare agency that is authorized by law of Congress, and responsible to Congress for its work—which gives such service year in and year out. This year, the American Red Cross has adopted a national campaign slogan to point up the urgency of the work it is doing. Defense is the keynote of the Red Cross in 1951.

March is Red Cross Fund Campaign month. The $85,000,000 goal set for this year is higher than last year, because there is more to be done. We all know of the work of the Red Cross in general. But how many of its specific activities are you familiar with?

First, civil defense is expanding at a snowballing rate. The Red Cross is called in at the very beginning of local planning for defense. Air raid practice, the handling of emergencies, the training of volunteers are all planned with the counsel and support of the American Red Cross. In the event of an air raid or attack, their work now will help save your industries, your homes and your lives.

Next, the Armed Services program of the Red Cross is already in full swing. Workers are at the battlefront and others have been added to staffs at home to aid the Armed Forces. A direct two-way line of communication between the serviceman and his family has been set up, and counsel is always available to him. The International Committee is trying to set up a prisoner of war program with the enemy. In addition, the Defense Department has asked the Red Cross to co-ordinate all private facilities for providing blood and plasma for defense, and to set up additional blood donor centers of its own. The job of providing blood for the Armed Forces is now the job of the Red Cross.

Meanwhile, disaster that strikes here at home receives instant and thorough Red Cross aid. In fire, flood or explosions, wherever help is called for in homes or in industry, a program of emergency aid goes into action at a moment's notice. The disaster program of the Red Cross is truly amazing in the care it gives to every need. Housing, food, and clothing are provided at once; canteens are set up for workers; medical supplies and blood plasma are provided. No problem is too great for this organization. After the emergency is over, a program of rehabilitation is undertaken to find what resources are available to victims of the tragedy. Anyone who needs counsel in obtaining benefits or information is given understanding help.

Finally, Red Cross carries its work straight to the individual by its program of training for first aid, home nursing and nurses' aide work. Literally millions have been trained, but the goal is even higher: one adult in every home trained for emergency first aid or care of the sick.

Red Cross stands for unity of purpose, and on a massive scale. But in spite of the scope of the work done, relatively few of us know who is behind this organization and how it operates. Over a million and a half persons work for the American Red Cross—but fewer than one in a hundred are salaried. The average salary is $2500 a year. The highest is $20,000 a year. The president, E. Roland Harriman, serves without pay at his own request.

The top policy-making body of the Red Cross is the National Board of Governors, composed of fifty members, eight of whom are appointed by the President of the United States, twelve elected by the Board itself, and thirty elected by local Red Cross chapters.

The national chairman of the 1951 Fund Campaign is David Sarnoff. In an inspiring and down-to-earth message, he said: "The Red Cross suffers from the fact that it has been around so long doing such a big job in so many places that some people tend to take it for granted. They assume, without thinking, that the Red Cross has an inexhaustible source of funds which can always be tapped to meet any needs. I am sorry to disillusion them. For the Red Cross is like the family car. The machinery is there, but it will take you only as far as the gas you put in the tank permits."

And there you have it. The job of mobilizing for defense is being done, will be done, only through our own efforts and our support of the agencies that are set up to do the work. To know the work of the Red Cross, so humane and worth while at any time but urgently needed now, is to support it. Give, or pledge, to the Red Cross this month.

NOW—Simpler, Faster, Automatic Titrations!

The BECKMAN Automatic TITRATOR

Here's another new Beckman advancement in instrumentation—*an instrument that runs your titrations for you.* It's the Beckman Automatic Titrator—the instrument that makes accurate titrations more rapidly and conveniently than by manual methods.

SIMPLE OPERATION: In a series of titrations, simply fill the burette, place the sample in the beaker—and the Beckman Automatic Titrator takes over from there. Raising the beaker holder into position automatically starts the stirrer motor and begins delivering titrating solution into the sample.

A special circuit electrically anticipates the approaching end point, scaling down delivery of the titrating solution in progressively smaller increments to assure a highly accurate titration. When the end point is reached, delivery of the titrating solution stops and a light shows completion of the titration—*all automatically and without attention from the operator.*

Whether your laboratory is large or small the Beckman Automatic Titrator provides important advantages in your titrating operations...

- *It releases the technician during titration, enabling him to perform other operations such as preparing samples, or calculating results.*
- *It eliminates the fatigue caused by close observation required in manual procedures.*
- *It gives objective, reproducible results... eliminates errors due to personal factors.*
- *It provides time-saving conveniences for sample handling.*

PERFORMS A WIDE VARIETY OF TITRATIONS—Neutralization, Oxidation-Reduction, Precipitation, Complex-Formation and other types.

NO SPECIAL TRAINING IS REQUIRED—rapid and accurate titrations can readily be performed without special skill or technique.

QUICK, SIMPLE OPERATION—completes many routine titrations in only 1-1½ minutes—even titrations to 0.1% accuracy in 2½ minutes or less. Change of sample is simple, rapid—a single motion raises, locates and secures new sample in operating position.

CONVENIENT, VERSATILE, ADAPTABLE—0° to 100° C temperature compensation . . . adjustable holder accommodates 10 ml to 400 ml beakers or similar vessels . . . instrument may be used with all standard burettes down to 5 ml . . . as many as four delivery units accommodated by single amplifier control unit . . . . uses standard Beckman electrodes . . . electrode holders and delivery tip can be pivoted into any required position . . . ample provision for mounting heating devices or other special equipment.

ALSO A RELIABLE pH METER—the Beckman Automatic Titrator can also be used as an AC-powered pH meter to give accurate readings over the range 0 to 14 pH, as well as millivolt readings from −600 to +1400 mv.

For full details on this new Beckman instrument see your authorized Beckman dealer—or write direct. *Beckman Instruments, National Technical Laboratories, South Pasadena 73, California.*

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BECKMAN INSTRUMENTS
control modern industries

Beckman Instruments include: pH Meters and Electrodes — Spectrophotometers — Radioactivity Meters — Special Instruments

The Paper Industry Current Comment

P.I. operates through maze of controls

Increase of NPA controls . . . insurance against lack of raw materials . . . Government set-back orders . . . the usual investigations, manpower problems, and current legislative changes all add up to a stupendous sum . . . but who has the correct answer? If you know it, you could break the bank on any quiz program.

THE PAPER INDUSTRY'S involvement in Washington developments of the month has as many facets as a specially cut diamond. Investigations, controls, scandal in high places, all had a part in the recent Washington picture. What to do about pulp, price and supply problems is troubling industry and Government agencies alike, with no immediate solution in sight. The pulp problem was shifted for a week to the industry convention in New York, but will be back in the lap of the National Production Authority in a matter of days.

The control picture was somewhat clarified during the month by the issuance of an order known as M-36 which calls upon all mills to reserve a certain proportion of their anticipated output each month to meet Government orders from a dozen Government agencies. The percentage of reserve varies from 5 to 10 per cent, depending on grades, and can be changed to meet developments as needs increase or decrease. Back in October the paper industry urged that some such order be issued to insure co-operation between industry and Government purchasers, and the eventual order is a compromise between the original industry proposal and the autocratic wishes of some Washingtonians in high places. Five months delay in the issuance of a crucial order is symptomatic of the "speed" in developing the mobilization program.

Paper mill exec. now heads P&P Section NPA— brings hopeful prospect

A hopeful sign however was the selection of Gabriel J. Ticoulat, vice-president of the Crown-Zellerbach Corp., as chief of the Pulp & Paper Section of the National Production Authority. This top ranking of an outstanding industry representative can be regarded as insurance against extremist trends in some Government quarters. Additional men with outstanding reputations in the paper industry have been chosen for other key posts, either as consultants or as heads of subdivisions of various control agencies.

While industry leaders, such as Charles E. Wilson, president of General Electric, and Eric Johnston, of the motion picture industry, have separated themselves from their industry positions at material losses in income, labor is demanding an increasing share in responsibility for management. One union leader was selected for a high position in the Production Authority, but insisted on being allowed to retain his union office and to be allowed to devote time to his union activities.

In the face of a demand by unions that they be allowed to bargain for wage increases higher than those considered equitable by the joint board of nine, consisting of three industry, labor and public members, the heads of the mobilization authority have said that there must be equal sacrifices by labor, industry and agriculture.

After weeks of discussion of controls and the promulgation of various orders, what has been called a wage-price freeze is, in effect, as impotent as an electric deep freeze machine with the power turned off. In the face of the Administration attitude toward labor it is problematical whether the war emergency will develop into an economic position where the real profiteers will be the unions representing only a fraction of American employment.

Newsprint investigation "bobs" up again

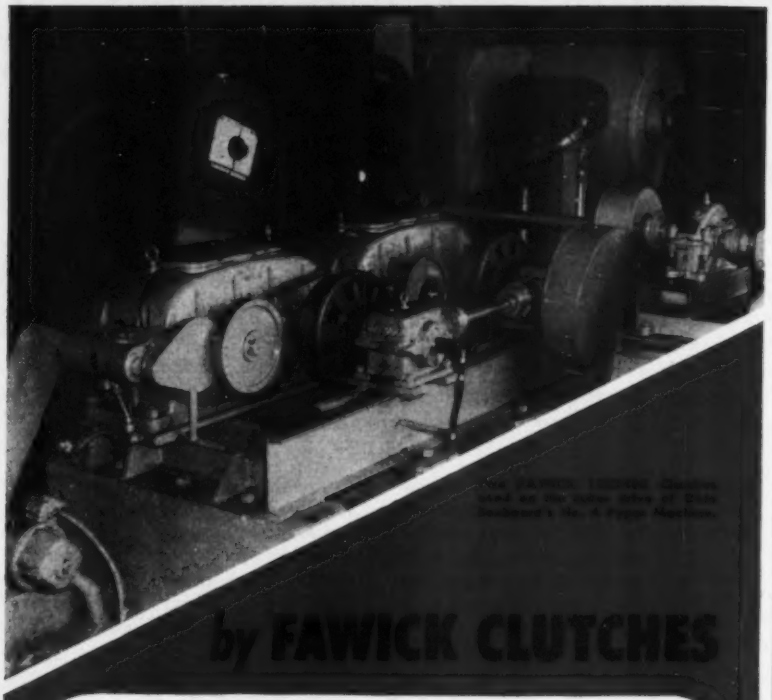
Another series of investigations of newsprint is under way. Although, as a witness before a Congressional Committee once stated, the United States newsprint industry is a very small tail on a very big dog, Congress is devoting so much attention to the demands of the publishers that Canada in disgust may be willing to allocate a larger part of its output to Europe and let the United States publishers stew in the broth their representatives at Washington are hotting up. One small newspaper publisher has suggested a supply freeze to give the small papers a supply of paper and avert black market operations. An allocation plan, however, according to best available information, is unlikely.

Paper industry people bring charges in RFC investigation

Scandal in high places at Washington has reached into the paper industry. A Senate Subcommittee headed by a leading Democrat issued a report early in February blasting policies in the Reconstruction Finance Corporation, charging that political influence was widely exerted to secure loans for favored borrowers. A personnel specialist in the President's secretariat was named, and also a White House secretary whose husband, through work with the RFC, was able to leap from a salary of a few thousand as a Government employe to an income of over $50,000 a year, alleged in part to be due to his success in securing RFC loans for his clients.

The paper industry broke into the picture when Robert E. Hartman of Mobile, Ala., founder and former president of the Mobile Paper Mills Company, charged that by Congressional pressure and RFC collaboration he lost his entire interest in and control of the company. Mr. Hartman has charged that Congressman Frank W. Boykin arranged a loan for the company from the RFC, and through a loan by his son squeezed the Hartman interests out of the company and secured control by the forced sale of stock with a par value of $640,000 for $32,000. Mr. Hartman charges that the sale was forced by the RFC as a condition for granting a $750,000 loan. Charges and counter charges in this case

Clean, accurate
PAPER CUTTING INSURED



by FAWICK CLUTCHES

The positive action of Fawick Airflex Clutches makes them particularly adaptable to paper cutting machines.

On the cutter drive shown above, Fawick Clutches play an important part by providing coordinated operation of the two cutting units. One clutch operates the first cutter (with a continuous-running squeeze roll) and the other clutch operates the second cutter and the second squeeze roll.

Full-power engagement and fast, reliable disengagement of the cutters are provided by the separately controlled Fawick Clutches.

Whether you have a similar clutch problem to the one shown here, or one involving other paper mill drives, Fawick can supply an Airflex Clutch that will provide years of top-efficiency service with unequalled low maintenance.

FAWICK AIRFLEX COMPANY, INC.
9919 CLINTON ROAD • CLEVELAND 11, OHIO

For detailed information on the advantages of FAWICK CLUTCH AND BRAKE UNITS as they apply to your machines, call or write the Main Office, Cleveland, Ohio, for Bulletin 300.

FAWICK Airflex
INDUSTRIAL CLUTCHES AND BRAKES

will result in an airing of the whole matter before the Senate subcommittee. It is merely incidental that a paper company is involved in the alleged saturation of a Government agency with political pressure. One outcome of the RFC disclosures has already been the introduction of a measure to entirely reorganize the Reconstruction Finance Corporation.

Seek assurance of necessary pulpwood

An increase in the production of pulpwood was seen as essential to the nation's economic needs by speakers at a meeting of the Primary Forest Products Industry Advisory Committee with National Production Authority officials at Washington. The conference included paper industry officials concerned with pulpwood procurement. It was recommended that timber, including pulpwood, be imported from Canada and Alaska to help expand production. This is contrary to the policy of the United States Forest Service which insists that the utilization of Alaskan pulpwood be confined to its use by new pulp mills to be built in that territory. Pulpwood was produced in the United States in 1950 at an unprecedented rate, it was stated by NPA officials, but further expansion is needed to meet 1951 demands.

Financial

The unprecedentedly high production of paper and paperboard in 1950 is reflected in the accompanying report of 1950 earnings by a large group of paper companies. Stock market values of paper mill securities have risen proportionately, and while present prices of all securities are at record peaks, there is no certainty that the present inflationary period will not result in eventually still higher prices.

Celotex Corp.—Net income for the fiscal year ended Oct. 31 was $3,003,552 as compared with $1,949,190 in the previous fiscal year.

Champion Paper & Fibre Co.—Net income for nine months ended Dec. 31 was $7,645,495 as compared with $6,008,979 for the comparable period in 1949.

Chesapeake Corp. of Virginia—Net income for 1950 was $2,777,835 as against $1,729,567 in 1949.

Container Corp.—Net income for 1950 was $12,000,000 as compared with $8,777,000 in 1949, these being preliminary figures only.

Hammermill Paper Co.—Net income for 1950 was $2,014,395 as against $1,027,062 in the previous year.

Hinde & Dauch Paper Co.—Net income for 1950 was $1,255,921 as compared with $740,730 in 1949.

Hoberg Paper Mills, Inc.—Net income for 1950 was $1,044,301 as compared to $933,677 in 1949.

Keyes Fibre Co.—Net income for 1950

GOING UP to cut Idaho's waste way down

This view shows four digesters being erected at the new mill in Lewiston, Idaho, of Potlatch Forests, Inc.

The Lewiston plant is the first pulp mill ever erected in the Gem State. With this mill, wood conservation in Idaho takes a big step forward. Now the sawmill waste and cull timber from Idaho's forests are being put to good use. They used to make bonfires—now they're the feed material for a mill that's built to produce 160 tons of pulp per day.

This conservation program is a boon to the state and a credit to the company, for preserving our timber is certainly essential in these critical times. We're pretty proud to have been associated with a program like that. Since its benefits are so far-reaching, we don't think you'll mind our pride.

For information about Horton* digesters—or any of the other steel plate structures we build for paper plants—write our nearest office.

Other states where HORTON* digesters have recently been installed to increase pulp production

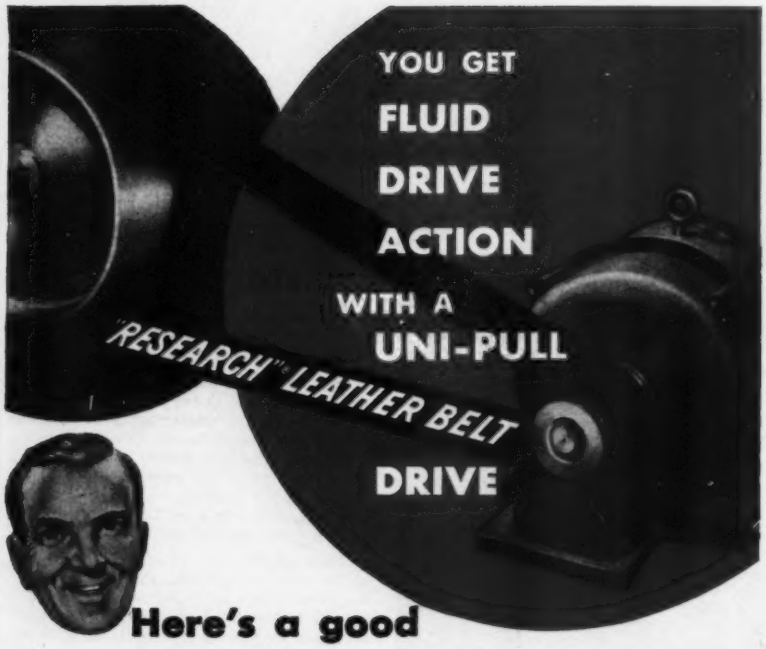
- Arkansas
- Florida
- Georgia
- Louisiana
- Oregon

*Trademark Registered in U. S. Patent Office

CHICAGO BRIDGE & IRON COMPANY

Atlanta, 3.....2143 Healey Building
Birmingham, 1.....1511 North 50th Street
Boston, 10.....1026—201 Devonshire Street
Chicago, 4.....2445 McCormick Building
Cleveland, 15.....2267 Guildhall Building
Detroit, 26.....1566 Lafayette Building
Houston, 2.....2143 National Standard Building
Los Angeles, 17.....1559 General Petroleum Building
New York, 6.....3350—165 Broadway Building
Philadelphia, 3.....1653—1700 Walnut Street Building
Salt Lake City, 4.....527 West 17th South Street
San Francisco, 4.....1547—200 Bush Street
Seattle, 1.....1327 Henry Building
Tulsa, 3.....1651 Hunt Building
Washington 6, D. C.....1138 Cafritz Building

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, ONT.



Here's a good example of Graton & Knight *Engineered* Flat Leather Belting

Success of your short center pivoted motor base drives depends on the FLUID DRIVE ACTION of the belts you use. They should possess these five quality features:

1. *High Coefficient of Friction* — to grip *across and around* the pulleys.
2. *Flexibility* — to withstand continuous flexing on short centers over small diameter pulleys.
3. *Resiliency*—to absorb starting torque and load shock.
4. *Minimum Permanent Stretch* — to maintain correct tension at all times.
5. *Great Tensile Strength* — to carry peak loads.

These five quality features describe RESEARCH, the premium quality flat leather belt made by a special process to give you FLUID DRIVE ACTION on Uni-Pull and other important drives. It is one example of G&K Leather Belting *engineered* to give more production-power.

Other famous G&K brands, developed through a century of service to industry, include HEART OAK, a rugged, firm belt for shifters and step-cone pulleys; and SPARTAN,® a combination tan resistant to oil, steam, acid and alkali fumes . . .

Let the G&K man help you *"drive it better with leather."*

GRATON & KNIGHT COMPANY
Worcester, Massachusetts

To assist you in engineering a short center drive, be sure to get a free copy of the new Uni-Pull Drive Manual. Write for it on your letterhead.

PREMIUM RESEARCH QUALITY

HEART OAK

SPARTAN®

YOU CAN DRIVE IT BETTER WITH LEATHER®

GRATON AND KNIGHT® *Engineered* LEATHER BELTING

was $1,361,794 as against $879,930 in 1949.

Kimberly-Clark Corp.—Net income for the fiscal year ended Jan. 31 was $11,276,946 as compared with $8,552,751 in the previous fiscal year. Available funds will be used for a contemplated material expansion of industrial and sanitary wadding, with some outside financing to provide the needed balance.

Marathon Corp.—Net income for the fiscal year ended Oct. 31 was $6,535,036 as compared with $4,519,217 in 1949.

Mead Corp.—Net income for 1950 was $6,306,073 as compared with $3,416,066 in 1949.

Rayonier, Inc.—Net income for 1950 was $10,804,660 as compared with $5,975,349 in 1949.

St. Regis Paper Co.—Net income for 1950 was $11,623,744 as compared with $5,478,203 in 1949.

Soundview Pulp Co.—Net income for January was $404,797 as compared with $390,393 for January, 1950.

Sutherland Paper Co.—Net income for 1950 was $2,784,850 as compared with $1,613,629 in 1949.

United States Envelope Co.—Net income for 1950 was $1,551,196 as compared with $874,751 in the previous year.

United Wallpaper Co.—Net income for six months ended Dec. 31 was $177,138 as compared with a deficit of $464,819 in the same period of 1949.

S. D. Warren Co.—Net income for 1950 was $2,636,290 as compared with $1,516,881 in 1949.

New York Stock Exchange—Stocks

Closing Prices

	Feb. 20, 1951	Jan. 20, 1951
A.P.W. Products	* 7¼–7⅝	7¼
Celotex	17⅝	16⅞
Same Preferred	16⅝	16⅝
Certain-teed Products	16⅝	15⅝
Champion P. & F. Co.	56⅝	49¼
Same Preferred	*107–108	104
Chesapeake Corp.	33⅝	35
Continental Diamond	15⅝	13½
Container Corp.	39¼	33½
Same Preferred	*103½–105	105½
Crown Zellerbach	52⅝	50½
Same Preferred	105	105¼
Dixie Vortex	53	46
Same "A"	53½	51¼
Eastern Corp.	20⅞	21½
Robert Gair	12⅜	9⅛
Same Preferred	* 19¾–19⅞	19⅞
Gaylord Container	25⅝	24¼
International Paper	53⅝	54
Same Preferred	107⅞	108⅝
Kimberly-Clark	45⅞	44⅝
McAndrews & Forbes	40	39¼
Marathon	42	42½
Masonite	31	32
Mead Corp.	26⅝	25⅝
Same Preferred	96	94½
Same 2nd Preferred	* 65–67	64
National Container	12⅝	12¼
Rayonier, Inc.	50⅛	50
Same Preferred	37¼	36⅝
Scott Paper	45½	43¼
Same $3.40 Preferred	*100¼–102	101
Same $4.00 Preferred	*107–107½	.....
St. Regis	13	13½
Same Preferred	95⅝	95⅝
Sutherland Paper	48	49
Same Preferred	120	119½
Union Bag & Paper Co.	42⅞	43⅝
United Board & Carton	19¼	18
United Wall Paper	4	3⅝
Same Preferred	* 26¼–27	25½
U. S. Gypsum	116½	107¾
Same Preferred	*182–185	183½
West Va. P. & P. Co.	82½	81⅝
Same Preferred	110¾	110½

New York Stock Exchange—Bonds

Closing Prices

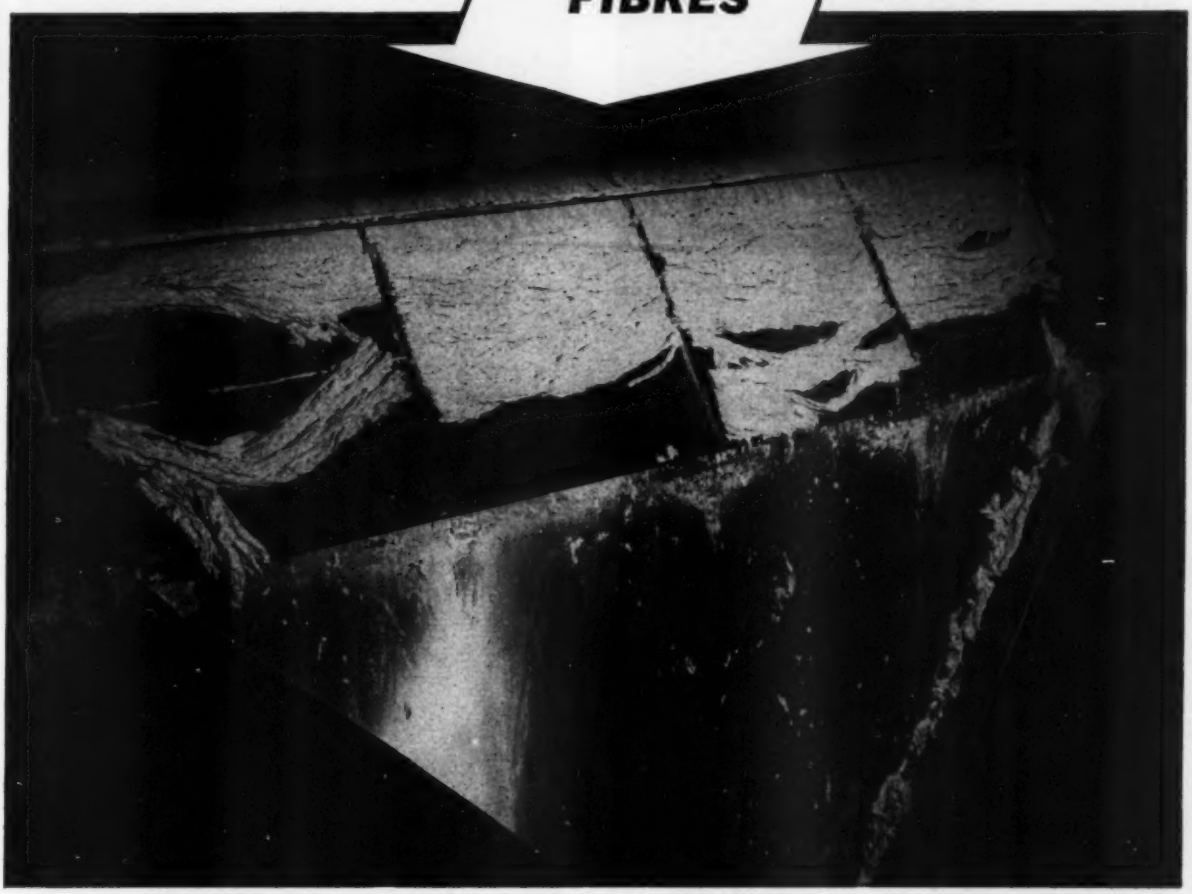
	Feb. 20, 1951	Jan. 20, 1951
A.P.W. Products 3⅝	96	95
Celotex 3¼%	102	102
Champion P. & F. Co. 3⅝	102	102¼
Mead Corp. 3⅝	107½	107

New York Curb Exchange—Stocks

	Feb. 20, 1951	Jan. 20, 1951
Am. Writing	8½	8⅝
Great Northern	48	48¼
Hammermill	31½	.....

*Closing Bid and Asked Prices.

ARE YOU LETTING THESE EXPENSIVE FIBRES GET AWAY?



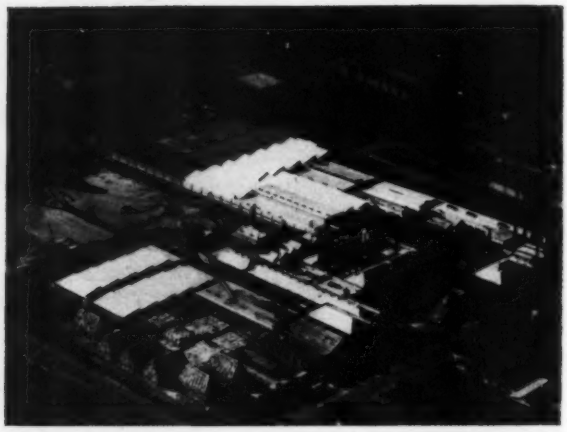
There never was a time when an adequate Bird Save-All closed white water system was more essential or more profitable than it is right now.

Take a look at the water leaving the paper machine. Are *you* letting any of it get away without rescuing those valuable papermaking fibres? If so, now is the time to look into

BIRD SAVE-ALLS

BIRD MACHINE COMPANY
SOUTH WALPOLE • MASSACHUSETTS

SAN JOAQUIN: Pulp and converting plants to be expanded



ANTIOCH: Rebuild one machine; another to be modernized

Fibreboard Products, Inc. announces

▶▶▶ A PLANT DEVELOPMENT, modernization, and improvement program which will cost over $5,000,000 has been announced by Fibreboard Products, Inc.

When the program is completed (probably early in 1952), it will result in greatly increased plant efficiency, more plant capacity in some instances, and a consequent stepping-up of production and quality level throughout the corporation's plants in the West. Subsidiary companies also will benefit, notably Glass Containers, Inc., Federal Container Co., The Maryland Container Co., Federal Container Co. and Precision Electrotype Co.

Antioch Division

Heading the list of improvement operations in Fibreboard plants will be the corporation's Antioch Division (Calif.) where something over two million dollars will be spent on new structures and equipment modernization. Included will be a new 142,000 sq. ft. concrete warehouse and shipping building, plus a new office building. The No. 3 Paperboard Machine will be completely rebuilt, utilizing the most modern stock preparation equipment available. This will result in increasing production approximately 100 per cent on folding boxboard and liner board. The No. 2 paperboard machine also will be modernized to increase production and improve product quality. Modern carton manufacturing equipment consisting of food pail machinery, 3rd color printing attachment, high speed printing and cutting press and two high speed gluers also have been added to the carton plant. This equipment will enable the plant to turn out a stepped-up volume of frozen food cartons, bakery cartons and other automatic set-up cartons. In the corrugating plant, improvements include additional taping equipment and a new partition assembler unit.

Stock preparation equipment is Shartle Bros., Black-Clawson; auxiliary equipment also is Shartle Bros.; press is a Mercury Hi-Speed with 3rd color Western Attachment. Gluers are Staude Master Gluer and International (Swifty) Gluer. New corrugating plant equipment consists of a Universal Taper and an S&S Partition Assembler.

San Joaquin will have new converting plant

At the San Joaquin Division, over half a million dollars is being expended on additions and improvements to the giant pulp mill and converting plant near Antioch, Calif., which started operations last year. (Cf. P. I., July, 1950, pp. 382) Primary improvement is a new converting plant to manufacture the popular Ex-Cell-O waxed paperboard milk containers with their unique "gable" top. The building originally designed for the purpose is now being made ready. This new plant increases the number of Fibreboard's mills and converting plants on the Pacific Coast to a total of sixteen. In order to further reduce plant odors and stack fumes, a new horizontal electrostatic Cottrell Precipitator is being hooked up with the present vertical precipitator. A new digester, two additional refiners and a slab-wood chipper are also being added.

The digester is a Consolidated Western; refiners are Jones-Jordan.

Plant additions at Sumner Division

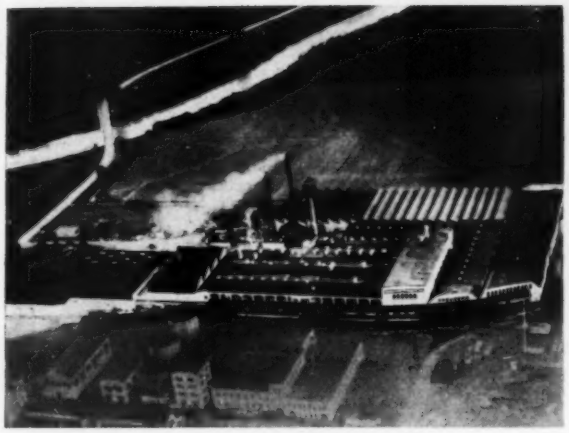
Well over half a million dollars is being spent on plant additions and modernization in the Sumner (Wash.) Division. A new steel, concrete and iron-siding building of 34,500 sq. ft. is being erected to house additional corrugating equipment including stitching, taping, slotting and printing machinery to increase output an estimated 300 per cent. Complete modernization of the mill stock refining equipment is also in progress at Sumner. Power plant facilities will be enlarged to take care of the additional load burden. Stock preparation equipment is in process of being thoroughly modernized.

Manufacturers of equipment to be installed at Sumner are a Langston corrugator unit, a Bliss stitcher, a Universal taper, a Langston Printer Slotter, with Shartle Hydrapulper; Emerson Refining equipment. The power plant boiler is made by C. C. Moore.

Half-million in new equipment at Vernon Div.

Plant additions, modernization and new equipment in the Vernon (Los Angeles) Division are being carried forward to the extent of some half a million dollars. The principal addition to this Fibreboard plant will be a new two story reinforced concrete building of 20,000 sq. ft., now in the process of erection. This will house a new 3rd color rotary press, two cutting presses and a high speed gluer. The No. 1 and No. 2 paperboard machines are also being modernized to increase boxboard production at this division.

The press and cutting equipment are



SUMNER: New building to house new corrugating equipment

STOCKTON: Press for 3-color work; add printing-gluing equipment

$5,000,000 expansion program

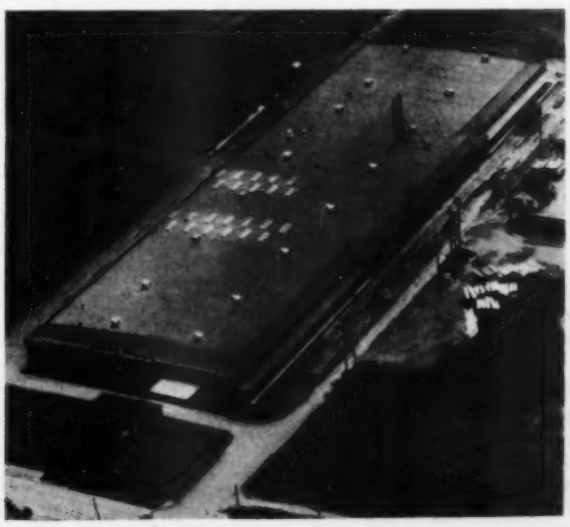
VERNON: Modernize paperboard machines; building for new presses

PORT ANGELES: Stock preparation equipment; modernize machine

T. R. Bland President
Fibreboard Products, Inc.

PORTLAND: New gluing and waxing equipment for more efficient processing of cartons for frozen food

R. E. Bundy, vice pres. in charge of production



manufactured by Miehle. Gluer is an International Hi-Speed machine.

Stock preparation equip. for Port Angeles Div.

In the corporation's Port Angeles (Wash.) Division, new stock preparation equipment and modernization are in progress amounting to a quarter of a million dollars. This includes an additional pulp machine which will result in increasing output to 3600 tons per year. A new and modern stock refiner is being installed and the No. 1 machine is being completely modernized with the installation of a new steam turbine drive and additional vat capacity.

The pulp machine is a Downingtown Fibrepulper. New turbine equipment consists of a Beloit Suction Drum and Machine Drive.

More equipment to be added at Stockton

A substantial sum is being expended in Fibreboard's Stockton Division for modernization and additional equipment. New printing and milk bottle gluing machinery is being installed in the carton plant; refining machinery has also been added to the mill stock preparation equipment. A printer-slotter, stitching and taping machinery are also being installed in the Corrugating Department. A 3rd color attachment will also be added to the printing press, enabling the plant to turn out 3rd color printing of cartons in one operation.

The following manufacturers are responsible for the construction of this machinery: printer-slotter, Hooper; stitcher, Bowee-Bliss; taper, S&G; gluer, International; refining equipment, Jordan-Jones; 3rd color attachment (Miehle Press), Western Printing Machinery.

Portland & South Gate share in improvements

New gluing and waxing equipment is being installed in the Portland (Oregon) Division in order to more efficiently process frozen food boxes as well as several new types of cartons for general use.

Gluing equipment is the Staude Master Gluer; Hot Waxing equipment.

In the South Gate (Los Angeles) Division, modernization of converting equipment is going forward, including new taping and stitching equipment.

Wholly-owned subsidiaries included in program

In addition to the foregoing modernization and plant expansion program for Fibreboard's sixteen western plants, the corporation's wholly owned subsidiaries will also receive in the neighborhood of $234,000. Glass Containers, Inc., will install new equipment in their Los Angeles and Antioch plants. The major expenditure will be in the Los Angeles plant where a new glass bottle and jar-making machine will be added. The Federal Container Co. in Philadelphia will put in a new corrugating taper and a new folder-stitcher.

The Maryland Container Co., Baltimore, will add a new gluer, wax-coating machine and stitching machine to their present equipment to speed up efficiency and plant output.

The taper machine will be an S&S Taper Machine, the folder stitcher a Bowee-Bliss product. International (Swifty) will supply the gluer, while an International wax coating machine and a Bostitch stitching machine will be used.

New laboratory

Also on the extensive list of allocations will be the $100,000 to be expended by Fibreboard Products Inc. for new laboratory equipment in the Research Division. This new testing apparatus will enable the corporation to maintain even more exacting control over the products of their plants and assist in the development of new or improved materials and processing in the manufacture of paperboard packaging materials.

Sulphite Pulp Mfrs. League Continues Study of Stream Pollution Problem

▶▶▶ PROGRESSIVE RESEARCH on the utilization of waste sulphite liquor is co-operatively conducted by the pulp and paper mills of Wisconsin. The Sulphite Pulp Manufacturers' Research League, the organized group which promotes this activity, regularly releases findings developed from experimental tests conducted from time to time at Wisconsin paper mill plants. Summarized results from some of these recent events include:

Green Bay—Principal purposes of a research contract entered into between the University of Wisconsin College of Engineering and the Sulphite Pulp Manufacturers' League are: (1) How spent sulphite liquor improves road surfaces and (2) how to get the greatest benefit from this waste when used for treating roads. Although waste sulphite liquor has been used during recent years as a road binder, J. M. Conway, president of the League, said: "A great need exists for more precise knowledge of engineering facts in this field. . . . Little definite nature is known about causes and effects, even though spent sulphite liquor has been used extensively for dust laying and surface binding on unpaved streets and roads, both in this country and in Europe."

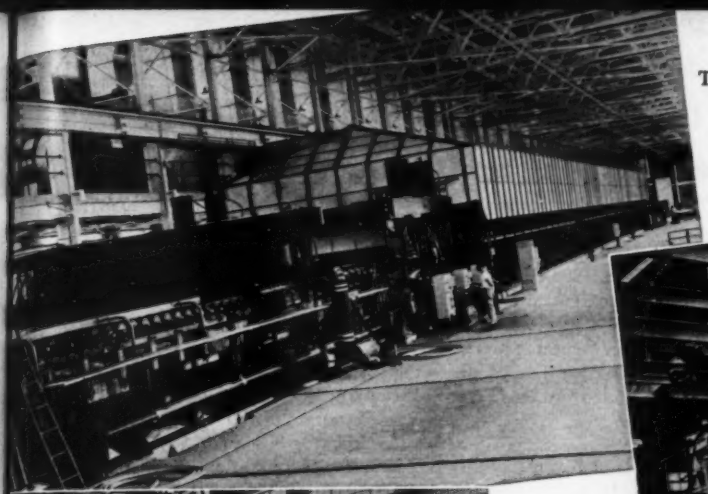
Under its agreement with the University, the League will pay salary costs and other expenses of a university faculty member to carry on active investigation in the College of Engineering.

Appleton—The industry's pilot plant was compelled to forego plans for studying some major problems involved in non-pollutional disposal of sulphite liquor of the type yielded by the ammonium-base pulping process. Alterations of the SS Swedish evaporator operated by the League were completed recently after a shutdown; the equipment had become clogged while concentrating some ammonium-base liquor. Further experiments to test the effects of ammonium-base liquor on the evaporator after modification were scheduled to start about last month. This liquor would be produced at the Interlake mill of Consolidated Water Power and Paper Co., as the company recently revealed that it was experimentally shifting part of Interlake's pulping capacity to the ammonium-base process. Now, Interlake was unable to get ammonia for this process shiftover during the recent railroad strike. With chemicals moving again, the experiment undoubtedly will be conducted as originally planned.

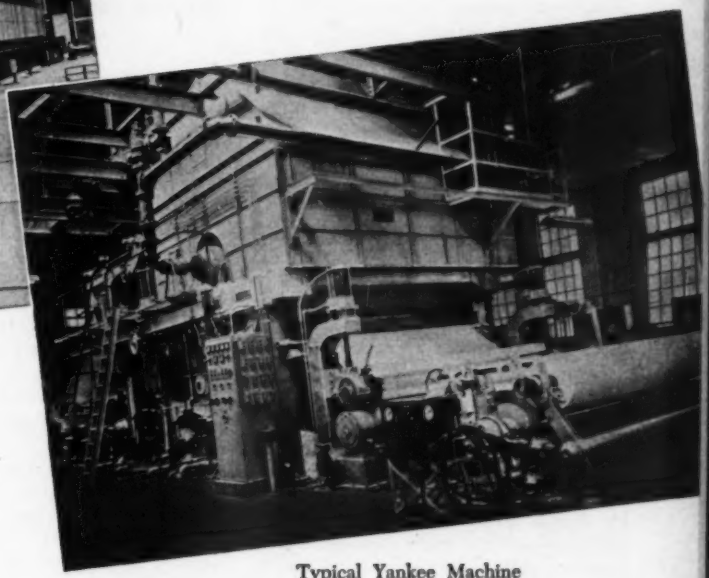
Peshtigo—After two weeks of experimentally burning spent sulphite liquor as industrial fuel, Badger Paper Mills shut down its test furnace on February 23 for modifications designed to permit burning this mill waste more completely and to produce a hotter fire. As soon as alterations have been completed, it is expected the burning tests will be resumed.

Spent liquor containing about 10 per cent solids in solution was boiled down to 55-62% solids in the evaporator pilot plant of the Sulphite Pulp Manufacturers' Research League at Appleton and shipped to Peshtigo by tank truck. Badger technical men, working with combustion engineers of Babcock and Wilcox Co., in recent months rebuilt two of the mill's boiler plant furnaces to use this material as fuel. The principal change they made at that time was adding a tunnel at the back of the furnace which serves both for preheating incoming air and for a combustion chamber to burn the concentrated liquor which is sprayed into the furnace.

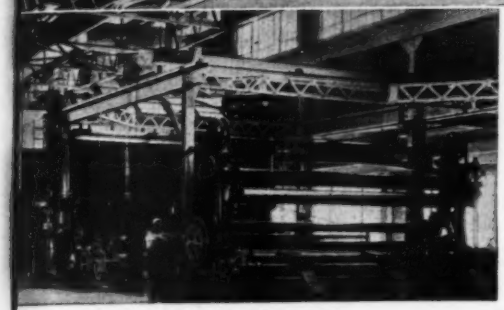
"On the strength of the experimental



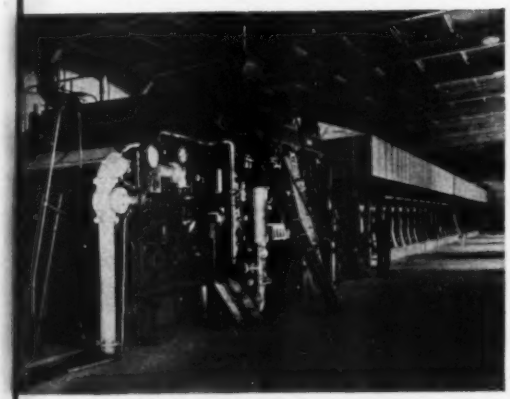
Typical Liner Board Machine



Typical Yankee Machine



Typical Newsprint Machine



Typical Cylinder Machine

Typical Bag Paper Machine

FULL PRODUCTION at Puseyjones

Take a trip through the busy shops at Puseyjones. See the new machines under construction — Fourdriniers, Yankees, Cylinder machines. See the exacting efforts of engineers and craftsmen reflected in higher speeds, greater tonnage . . . each machine incorporating the benefits of over 100 years of experience in machine-building.

Under construction is a large, high-speed Fourdrinier machine for lightweight Kraft for a mill in Florida; a Fourdrinier machine for Kraft paper and liner for installation in Colombia, South America; a high-speed Fourdrinier Yankee machine for lightweight Kraft for installation in Louisiana; a large book paper machine for installation in Wisconsin, a Cylinder Specialty Machine for installation in North Carolina, and a large high-speed Fourdrinier machine for Kraft bag paper for a mill in Georgia. Several Stream-Flow Vat Systems are also under construction for board mills in Alabama and New Jersey.

Puseyjones has just delivered a Fourdrinier machine for ground-wood specialty papers to a mill in New York State, and a three-roll newsprint machine for India.

Talk over your paper-making problems with Puseyjones engineers. Get all the facts on the high-speed, quality production machines that are coming from Puseyjones. Write today.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U.S.A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

results thus far," says Badger Paper Mills' plant superintendent John Hanson, "we have confidence that our company will eventually get its present equipment to burning sulphite liquor well enough to make the operation economically supportable. But there still are a number of difficulties to overcome before we can consider the problem solved."

Subjects and Speakers Announced for U. of Maine Spring Course

The spring schedule of speakers in paper technology has just been announced by the Pulp and Paper Division of the Chemical Engineering Department of the University of Maine.

The year just ended is the third one in which lecturers have been invited from industry to present subject material to the students. The agenda for the spring course is as follows:

Feb. 6 — "Personnel Management," John H. Milliken, director of personnel relations, S. D. Warren Co., Cumberland Mills, Maine.

Feb. 13—"Beating and Refining," C. K. Textor, The Bauer Bros. Co., Springfield, Ohio.

Feb. 27—"Fillers and Loading," Wm. R. Willets, Paper Development Lab., Titanium Pigment Corp., New York City.

March 6—"Paper Sizing," P. F. Neumann, manager, Technical Service, Paper Makers Chemical Dept., Hercules Powder Co., Wilmington, Del.

March 13—"Paper Coloring," Dr. E. I. Stearns and F. O. Sundstrom, Calco Chemical Div., American Cyanamid Co., Bound Brook, N. J.

March 20—"Paper Machine—Wet End," Paul C. Baldwin, paper mill supt., Scott Paper Co., Chester, Pa.

March 27—"Paper Machine—Dry End," W. J. Walker, gen. supt., St. Regis Paper Co., Bucksport, Maine.

April 10—"Paper Coating," Norman I. Bearse, vice pres., Champion-International Co., Lawrence, Mass.

April 17—"Paper Converting," Charles W. Stillwell, dept. head, Chemical Research, Dennison Mfg. Co., Framingham, Mass.

April 24—"Paper Testing and Specifications," Joseph King, tech. service, Eastern Corp., Brewer, Maine.

May 1, "Wastepaper—Its Collection and Usage," (to be announced).

May 8—"Coarse Papers—Bags and Boards," A. G. Durgin, supt. of research, Brompton Pulp and Paper Co., Ltd., East Angus, Quebec.

May 15—"Special Papers," (to be announced).

May 22—"The Graphic Arts," Milton Zucker, research manager, International Printing Ink, Elizabeth, N. J.

Paper Industry Gets Set-aside Order from NPA . . . 5 to 10 per cent

▶▶▶ PRODUCERS OF PAPER are now required to establish reserves of designated grades in percentages of their monthly production to fill qualified Government orders. At the same time, NPA reveals it is considering steps to reduce consumption of paper by Government agencies not engaged in defense activities.

This order (M-36, issued February 8) is not expected to reduce the amount of paper available for civilian consumption, since it is designated to make possible the handling of Government orders with the least possible disruption to normal paper production and distribution. The order is effective with February and applies to each month thereafter.

The order affects an estimated 300 to 400 manufacturers. Types of paper covered by the order and the percentages required to be held in reserve to fill Government orders, are: Newsprint and groundwood papers, 5 per cent; printing and converting papers, paper-machine coated, book and fine papers, 10 per cent; coarse papers (unbleached kraft grades only), 10 per cent; coarse papers (other than unbleached kraft grades), 5 per cent; special industrial papers, 5 per cent; sanitary papers, 5 per cent; crepe wadding for packing, 10 per cent; tissue papers (other than crepe wadding for packing), 5 per cent; and absorbent papers, 5 per cent.

Except for DO (defense rated) orders, acceptance of Government orders by paper producers remains on a voluntary basis under the order. If, however, a producer does not voluntarily accept Government paper orders equivalent to his monthly reserve, NPA may issue directives requiring him to do so.

Reserves not exhausted by the tenth day of the month, either by voluntary acceptance of orders or by NPA directives, are released in that month for private commercial orders.

Producers will submit reports to NPA each month showing total Government orders filled during the preceding month. These reports will state the volume of Government orders voluntarily accepted for delivery in the next two months. Both the producer and NPA will then have current records showing Government business credited to each producer's reserves and the amount of unused reserve subject to NPA directives.

Defense rated orders must be accepted as in the past, NPA said, except that manufacturers need not accept them in quantities beyond the specified reserves for Government business. Neither is the manufacturer required, unless specifically directed by NPA to accept rated orders received less than 40 days prior to the first of the month in which shipment is requested.

Government agencies whose paper requirements come within the scope of today's order are: Department of Defense, Atomic Energy Commission, U.S. Coast Guard, National Advisory Committee for Aeronautics, Civil Aeronautics Administration, Tennessee Valley Authority, Bureau of Prisons (Department of Justice), Bureau of Engraving and Printing, Government Printing Office, General Services Administration, Post Office Department, Office of Rubber Reserve (Reconstruction Finance Corporation), and producers of products or parts of products for any of these agencies, to the extent that the primary paper is to be used exclusively as a component part of the product to be delivered on a contract or purchase order issued by any of the listed agencies.

C-Z Issues Data on Seeding Program With Use of Helicopter

When Crown Zellerbach, Portland, Oregon, completes its season forest restocking program in April, more than 4200 acres will have been planted to tree seedlings or sown to tree seeds from helicopters. Helicopter seeding, as described in the February, 1951, issue of this magazine, involved the sowing of 2274 acres by C-Z in November. Western hemlock, Sitka spruce, Noble fir, Western Red-cedar and Douglas fir totaling 206 million viable tree seed have been sown on four of the eight C-Z Tree Farms. Acreage sown by helicopter amounts to 1474 in Oregon and 800 in Washington.

Hand planting, which began in November, is continuing on five of the eight C-Z Tree Farms. The program calls for the planting of 1940 acres, 1070 of which have already been completed. Sitka Spruce, White fir, Noble fir, and Douglas fir totaling 873,000 trees is required for the program, in one, two and three year old trees. Most trees used are taken from the Forest Industries Nursery, Nisqually, Wash., which grows 10 million trees yearly for privately-owned timberland planting; this year, C-Z also obtained trees from the nursery of the Division of Forestry, Olympia, Wash., and Clarke-McNary Nursery, Wind River, Wash. Acreages being planted on Tree Farms total 1940 acres.

Probably the least known, but actually one of the most progressive forestry

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Kraft envelopes don't have to look dull or lifeless. Color can add a lot of eye appeal—and sales appeal—to them. An attractive yellow-tan tone on your Kraft envelopes creates a better impression for your customers . . . and for your product.

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Powell Valves for the Paper Industry include not only a complete line of standard valves of all types but also special designs in corrosion-resisting metals and alloys to meet the latest requirements of the modern mill.

Quality fine throughout "The Line"

New 150-pound O. S. & Y. Gate Valve. Available in a wide selection of corrosion-resisting alloys. Made with either flanged or screwed ends. Sizes ¼" to 8", incl. All dimensions of flanged end valves conform to MMS Standard SP-42 and ASA B16.

POWELL

The WM. POWELL CO., 2525 Spring Grove Ave., P. O. Box 106, Station B, Cincinnati 22, Ohio

steps on Crown Zellerbach Clatsop properties, is the snag-felling project which is now entering its fourth year. Already approximately 38,000 snags, left from the old Wolf Creek burn, have been felled on 4700 acres. About half of these were merchantable, although the rest were worthless. By dropping the snags, C-Z has created a fire-proofed corridor six miles long and one to two miles wide from the Jewell-Astoria highway to South of the Sunset highway—a fine protection for the Southeast flank of the Clatsop Tree Farm. The de-snagged acres are restocked by hand planting and aerial seeding.

Expansion Planned for MacMillan Nanaimo Mill

An expansion involving an expenditure of $900,000 is planned for the Nanaimo, B. C., pulp mill of H. R. MacMillan Export Co. Two additional digesters and four new chip silos will be installed, and a deep sea wharf will be constructed.

The new equipment will allow the mill to handle more types of wood fibers and greater segregation of wood chip species; completion of the new wharf will enable cargo to be taken on at the plant by ocean-going vessels.

Great Lakes Paper Acquires Stock in Northern Wood Preservers, Ltd.

A substantial stock interest in Northern Wood Preservers, Ltd., Port Arthur, Ontario, has been acquired by Great Lakes Paper Co., Ltd., Fort William, Ontario. The acquisition has been made to allow a more economical utilization of all forest species; in accordance with Ontario Government forest policies, all future cutting on areas held by the two firms will be completely integrated.

Larger-size timber, utilized for poles, railroad ties, etc., will go to Northern Wood Preservers, and pulpwood timber to Great Lakes Paper. In recent years, Northern Wood Preservers activities have been curtailed because of a timber shortage on its own cutting areas; now, although sawlogs, poles, and tie timber from Great Lakes Paper operations will be utilized, additional lumber will have to be obtained elsewhere if three-shift operations possible on its 30-40 million foot sawmill are to be carried on.

Although Great Lakes Paper will be represented on Northern Wood Preservers' new board of directors, the Northern firm will retain its own identity with R. J. Prettie as president and managing director. No change in company policies is anticipated, although long range plans are under consideration which will allow new product development and product output.

Miniature paper mill is feature of new Three Rivers School

▶▶▶ A NEW SCHOOL which is said to house the only completely equipped miniature paper mill in the world to enable students to learn every phase of the technical side of the paper-making industry will be officially opened around April 1 at Three Rivers, Quebec.

The school is operated by the Quebec Department of Youth and Social Welfare. It was built at a cost of $1,500,000 with funds contributed jointly by Ottawa and Quebec. Its purpose is to supply the ever-expanding industry with a steady supply of technicians.

The school was first established in 1923, and was then operated by the Department of Lands and Forests under the direction of the Three Rivers Technical School. In 1944 it was placed under the supervision of the Department of Youth and Social Welfare, which has direction of all specialized youth training in Quebec.

Gaston Francoeur, director of the school, stated that at present there are about 50 students from Canada, the United States and Mexico who follow the three-year course. They are given courses in all branches of the work done in a paper mill, but until the completion of the new school they did not have the opportunity to carry out in practice the theories learned in the classroom.

The new school, which will accommodate approximately 100 students, has a model mill designed to handle any kind of pulp, sulphate, soda, sulphite semi-chemical, straw, rags and groundwood. The model mill has a capacity of approximately five tons of newsprint in 24 hours. The machine at the school is capable of producing any grade of paper. The only difference between the operation of the miniature machine and full-size equipment is in running speed—the model machine produces around 200 feet of newsprint per minute, while a big newsprint machine produces around 1000 to 1600 feet.

Nearly all the machinery for the new school had to be specially designed. Where possible, pumps and similar equipment were used as in actual mill equipment. Other machines, such as the beater, had to be made up from specially designed patterns.

Students must have completed their twelfth year of school in order to enter the new pulp and paper school. Fees are about $40 annually for students from the Province of Quebec, and approximately $100 annually for students from outside the Province of Quebec.

After completion of the course, the student is practically guaranteed a job, with many openings for the thoroughly trained young paper technicians. In addition to serving as a training center for Canadian and U.S. paper mill technicians, it is thought that the new school may also serve to train students from under-developed countries under President Truman's point-four program.

Modern Development Lab. Planned by C-Z for Its Plant at Camas, Wash.

A large, modern development laboratory will be built by Crown-Zellerbach Corp., San Francisco, at its Camas, Wash., Central Research Department. A complete experimental paper mill with multipurpose converting equipment, the laboratory will contain all equipment necessary to convert wood to a finished paper product. Additionally, the Engineering Section will serve the mills, and make pilot plant studies on research projects.

A. B. Layton, company vice president in charge of research and development, has commented that C-Z eventually plans to erect a new research laboratory adjacent to the proposed development laboratory. Temporarily, the development laboratory will provide most immediately needed facilities for the corporation's long-range research plans.

An experimental paper machine—a combination cylinder and fourdrinier machine which trims 24 inches and will be equipped with a flexible drive—is the most important single piece of equipment in the laboratory. Maximum speed will not be as high as large production machines, but mill conditions will be approximated to high efficiency. This paper machine may be furnished with mill stock or pulp made in the laboratory in a large experimental digester; a small chipper is part of the digester equipment. Refining and bleaching equipment will make possible complete preparation of fiber stock as required by project studies.

An all purpose coating and impregnating machine for treating paper will be part of the laboratory.

The new laboratory will permit experimental runs to be made without interruption and loss of production in large mills. The building, a 200 x 75 foot structure, will have a steel frame structure with concrete panel walls; main parts of the building will be a maximum of 16 feet in height, although an 80 x 25

foot center section will be 32 feet tall so that tall equipment may be accommodated. There will be 15,000 square feet of working space on the main floor and about 1500 on the second.

Kimberly-Clark Will Add Another Machine at Memphis—Expansion in Other Plants

With the announcement on February 19 that Kimberly-Clark Corp., plans to install a fourth crepe wadding machine at its Memphis plant, it is estimated the production of the plant will be increased to 200 tons daily, more than double the original capacity of 80 tons.

According to Chas. E. Eubank, Memphis mill manager, about two years will be required to complete this installation and the cost will be somewhat in excess of $2,000,000.

When the plant was first established in 1946, facilities were made for ultimate expansion to four machines. Last June the company announced the proposed installation of a third machine; its operation is expected by midsummer.

The expansion at Memphis is only part of Kimberly-Clark's $20,000,000 building program which will increase production and conversion of crepe wadding by about one-third. Plants at Niagara Falls and Neenah (Wis.) will be enlarged. Also, the company's Canadian subsidiary has just completed doubling its paper mill capacity.

Lowell Offers Course in P&P Technology at Fabric Res. Labs. in Boston

A unique course in the study of wood technology and paper microscopy has been organized at Fabric Research Laboratories, Boston, for students of Lowell Textile Institute, Lowell, Mass. At no charge to the school, the research company is proving the course instructor—Horace N. Lee, chief microscopist at Fabric Research for the past eight years—as well as space and equipment for the course. Classes will meet three hours a week throughout the college year for lectures, demonstrations and laboratory work.

Fabric Research and Lowell have been closely associated for a number of years. Shortly after the school opened its paper department in 1949, the research firm opened a paper section to offer a consulting research service to the pulp and paper industry; Dr. Geoffrey Broughton, head of Lowell's paper division, is director of the Fabric Research paper research section.

FOUR TREE FARMERS FROM WIDELY separated parts of the country were featured on the Your Business Reporter radio show sponsored weekly by the National Association of Manufacturers. Charles A. Gillett, managing director of American Forest Products Industries, Washington, D.C., outlined the objectives of the Tree Farm movement, and the four tree farmers explained how it had become a profitable business.

WATCHES PRESENTED by Powell River Company's vice pres., M. J. Foley, to veteran employees, Arthur Rea (left) and Comptroller J. A. Kyles for completing 25 years of continuous service with the company. Thirty employees became eligible for membership in the Club.

Powell River 25-yr. Club Welcomes New Members

Only seven years ago the Powell River Company, Powell River, B.C., instituted its 25-year club. Last month 30 company employees were added to the Club's membership, which now totals 163; with 42 additional retired employees.

At the Club dinner held recently, M. J. Foley, executive vice president, presented the new members with engraved gold watches; Russell M. Cooper, resident manager, welcomed them in behalf of the company. Club president Tom Fleury was chairman.

In his presentation address, Mr. Foley drew an interesting comparison between conditions in Powell River in 1925 (the year the new members joined the Company) and today. "When you joined the Company," he declared, "Powell River was in the middle of an 8½ million-dollar expansion program which saw the installation of Nos. 5 and 6 newsprint machines. We had an average of 890 employees as against 1900 today. We produced 75,000 tons of newsprint; in 1950 the figure had risen to an all-time high of 295,000 tons of newsprint and 40,000 tons of pulp. Our investment in 1925 represented $15,000,000; today it is over 65 million."

Mr. Foley reminded the audience that "Welfare benefits for employees have kept pace with our industrial expansion. The Pension Plan has been revised and broadened; additional Group Assurance covering has been provided . . ."

Forest Service Grants Logging Permit to Publishers Paper Co.

An eight-year co-operative agreement has been signed by Publishers Paper Co., Oregon City, Oregon, and the U. S. Forest Service which permits the paper company to log 40,000,000 board feet of timber from the Cascade Head experimental forest near Otis. The first of its kind in the Northwest, the agreement will permit continuing research studies in cutting and reforestation. Cutting on the first eight units will start within a few weeks.

Timber will be purchased at appraised prices; logging will be planned to develop new forestry practices. Several types of clear and selective cutting will be tested first. Losses from wind throw on cutover areas have been great—different sizes and shapes of cutover blocks will be tried to seek a remedy. Horse and tractor logging will be used to attempt to find a cheap logging method which will not damage trees left standing, as both spruce and hemlock decay if injured in logging.

Means of reducing weight of logs will be sought, since hauling costs amount to about one third of the total in much coast timber; one promising method to be tried is that of poisoning trees prior to cutting them.

Several other cutting experiments are

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HERCULES' TECHNICAL RESEARCH in the rosin size field has once again resulted in an improved, amazingly simple, automatic emulsifying unit that merits the attention of paper manufacturers everywhere. This new automatic emulsifier is lower in price than the first Hercules automatic emulsifying unit introduced to the paper trade in 1948.

The original Hercules automatic emulsifying unit was the first in its field, and offered a completely new technique in handling and emulsifying paste rosin size.

Twenty paper mills have already installed this revolutionary rosin size emulsifying process, and additional units are scheduled for early installation. Write for details.

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SIZING MATERIALS AND CHEMICALS FOR PAPER

in progress on a commercial basis in other national forests. Last year 22 such experiments were conducted in the Northwest, four of them on private lands.

Publishers Paper plans to pattern cutting on its own timberlands in Tillamook County, Oregon, after the Cascade experiments. The contract will supply the firm's Oregon City mill with a steady source of pulp logs.

New Pipelines May Aid Soundview & Weyerhaeuser Waste Disposal Problem

As an immediate solution to their waste disposal problems, Soundview Pulp Co., San Francisco, and Weyerhaeuser Timber Co., Tacoma, Wash., are constructing a pipeline which runs between their adjoining pulp mills at Everett, Wash., to carry effluent 4000 feet out into Puget Sound, where it will be discharged 300 feet below water surface.

Weyerhaeuser in 1948 constructed a large pilot plant and began exhaustive research on the pollution problem, hoping to have a method of disposal perfected by the September, 1951, contamination removal deadline imposed by the State of Washington; Soundview Pulp has been making similar studies.

However, engineering problems connected with a plan which would recover lignin from the waste waters cannot conceivably be solved by the deadline. The pipeline installation, while only a temporary measure, has been approved by the State.

Textbook Revisions

A report from R. S. Kellogg, secretary of the Joint Textbook Committee of the Paper Industry, states that the first of the four volumes on the new series entitled *Pulp and Paper Manufacture* made its appearance last September. The McGraw-Hill Book Company—the publishers—are proud of this fully up-to-date work entitled "Preparation and Treatment of Wood Pulp." It is a beautiful and authoritative book without a rival or competitor in the world-wide field of pulp and paper making. Many willing contributors, skillfully guided by the Editor, made possible this book of 1043 pages and more than 300 illustrations. It is estimated that authors and reviewers of manuscript devoted over 8,000 hours to the project. The Committee deeply appreciates their invaluable help. (Cf. New Literature, this issue.)

The same generous co-operation insures a correspondingly complete production of the other three volumes, progress on which is as follows:

Volume 2 "The Preparation of Stock for Paper and Board" has been in the printer's hands for some months. The chapters are: 1. Treatment of Rags and Other Fibres; 2. Processing of Waste Papers for Boards and Printing Papers; 3. Beating and Refining; 4. Fillers and Loading; 5. Sizing of Paper; 6. Coloring of Paper.

Volume 3 "Manufacture and Testing of Paper" is complete except for parts of the chapter on Papermaking Machines. The tremendous job of making the many new illustrations for this volume has been proceeding for several months.

Volume 4 "Auxiliary Pulp and Paper Mill Equipment." The manuscript and drawings are well toward completion.

No prediction is possible as to the exact date when these volumes will be on the market, but every effort is being made to produce them as rapidly as circumstances permit.

The Committee would be remiss, did it not once more record its appreciation of the patient, untiring and exceedingly capable editorship of J. N. Stephenson and the splendid co-operation of the McGraw-Hill Book Company throughout the thirty-two years since the pulp and paper industry of North America initiated an educational project the success of which has far exceeded the expectations of the little group which met in Buffalo, N.Y. in September 1918.

Rhinelander Plan Keeps Sauer Nursery in Operation

A plan offered by Rhinelander Paper Co., Rhinelander, Wis., to underwrite much of the cost of continuing the U.S. Forest Service's Hugo Sauer nursery near Rhinelander has been approved by the Wisconsin conservation commission; the Rhinelander firm will work in a co-operative program with the U.S. Forest Service and the state conservation department. Nursery operations for this year will begin in March.

It had been announced that limited funds would force the Forest Service to discontinue the nursery; under the Rhinelander proposal, the paper company will finance the operation of the nursery—maintained with Forest Service personnel—and the state conservation department will distribute the trees. Rhinelander will be reimbursed from the sale of planting stock, but has agreed to spend a maximum of $10,000 over and above receipts from tree stock sales to keep the nursery in production.

Folke Becker, Rhinelander president, has commented that his firm is co-operating with the Forest Service and state conservation department so that an adequate supply of tree stock may be maintained in Wisconsin. The nursery will produce about 2,000,000 young trees a year; nursery beds now hold 850,000 two year old red pine and 250,000 two year old white spruce.

The Hugo Sauer nursery, begun in 1931, was increased from 16 to 32 acres in 1934; it has produced more than 150,000,000 trees thus far. It provides complete modern equipment, a seed extractory, and good soil.

GROUND HAS BEEN BROKEN at Green Bay, Wis., for an addition to the boiler plant of Northern Paper Mills, as the first step in a million dollar project to increase capacity of the mill and reduce pollution of Fox River and Green Bay. (See articles, January, 1951, P. I.) The increased boiler capacity is needed to provide steam essential to the new evaporation equipment being installed to reduce pollution.

A FIVE-UNIT PULP AND PAPER mill is planned for Alberta, Canada, by Edmonton Pulp and Paper Mills, Ltd. The initial unit, necessitating an expenditure of $16,000,000, will be used for the manufacture of newsprint, kraft, and certain types of dissolving pulp; all five units of the proposed plant will probably be completed by 1961.

A WAREHOUSE AND OFFICE building will be built at Los Angeles for Sabin Robbins Paper Co. at a cost of $250,000. The modern, steel-reinforced concrete structure, which will be equipped with such modern conveniences as air conditioning, employee shower rooms and a full electric kitchen, will be situated in the central manufacturing district of Los Angeles.

CORRUGATED BOXES ARE BEING PRODUCED at the new Elmira, N.Y., plant of Hankins Container Corp. The plant, furnishing a floor space of 100,000 feet exclusive of the boiler room, machine shop and glue-mixing room, will produce about 6,000,000 boxes a month when full production is reached. Output will be directed to customers in Western and Central New York State and Northern Pennsylvania.

BELIEVED TO BE A WORLD RECORD, a 304 inch paper machine at the Great Lakes Paper Co., Fort William, Ont., recently produced 275.39 tons of newsprint in a 24 hour period. The previous record was 268 tons in a similar run.

EXCLUSIVE SALES RIGHTS on imported lampshade parchment paper, made by the Renker-Belipa mill in the Rhineland area of the American occupation zone of Germany, have been granted to Arthur Doniger Paper Co., New York. The paper, available in either hand-

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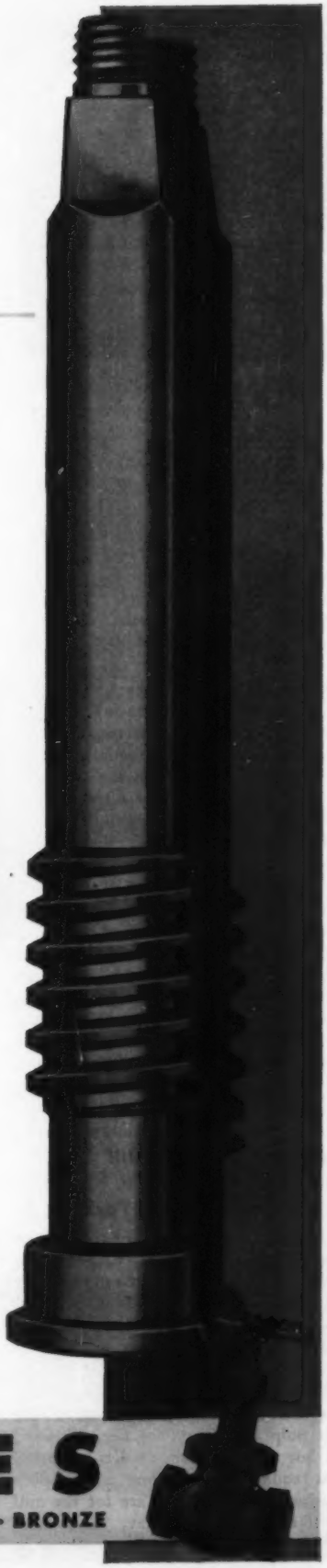
. . . because it's machined from OIC Alloy 40



Months ago, we introduced Alloy 40 to the field; use has confirmed our laboratory tests. Now, we are ready to tell you about it.

Alloy 40 completely eliminates galling and seizing. It is harder and stronger. It is highly resistant to attack by corrosive liquids and semisolids. It lasts longer!

All OIC Bronze Valves are now equipped with Alloy 40 stems. The Ohio Injector Company, Wadsworth, Ohio.

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made or machine-made sheets and rolls, is said to be unlike any lampshade parchment manufactured in America.

Bruce S. Old

Robt. R. Anderson

A. D. Little Reviews Best Year in History— Bruce Old Made a V. P.

A report issued to its stockholders by Arthur D. Little, Inc., Cambridge, Mass., announces the year 1950 as the most active year in the company's history. The rapid expansion that has taken place during the past several years was largely credited with this record, not the war alone.

Expansion of the company's commitments outside the continental United States included increased responsibility for the Puerto Rican industrial development program, for which the company acts as consultant. Also mentioned is its integration into the national emergency economy and the development of valuable by-products of sisal for a large plantation in the Republic of Haiti.

The election of Dr. Bruce S. Old to vice president of Arthur D. Little, Inc., also was announced. Dr. Old has been with the company since 1946, in charge of process metallurgy, and he has been a director since 1949. He is a graduate of M.I.T., and has had a rather broad experience in research development, both with the Government and industry.

Stevens Point Pulp Mill Leased by Strange Co. to Jay Corp., of New York

The sulphate pulp mill of the Stevens Point Pulp and Paper Co., Stevens Point, Wis., has been taken over by the Jay Corp. of New York, with a three-year lease carrying an option to purchase.

This plant, formerly owned by the John Strange Paper Co., Menasha, Wis., has been idle since 1949. Some of the wet pulp machinery has been disposed of, but the Jay Corp. expects to install new equipment including a dry pulp machine. Present plans are for the mill to be in operation by May.

When the mill closed down, about 80 employees were laid off. It is expected that a number of these will be rehired. This transaction has caused Strange to dispose of a petition put before the public service commission to abandon the mill on the Big Plover River.

Worthington-Gamon Is Now a Company Division

A former subsidiary of Worthington Pump and Machinery Corp., Harrison, N.J., Worthington-Gamon Meter Co., Newark, N.J., has been made a division of the corporation. The new division will continue the manufacture of liquid meters at its Newark plant.

Robert R. Anderson, formerly president of Worthington-Gamon, has been elected a vice president of Worthington Pump and will act as general manager of the new division.

SELLING AGENT FOR market pulp of the new Prince Rupert, B.C., plant of Columbia Cellulose Co., Ltd., New York, is Bulkley, Dunton Pulp Co., Inc., The plant is expected to go into production early this year. (Cf. P.I., September, 1950) Columbia Cellulose is the Canadian subsidiary of Celanese Corporation of America.

NEW YORK OFFICES OF The Beckett Paper Co., Hamilton, Ohio, were closed February 1. This office was managed by Orin R. Summerville from its installation in 1934 until last year; since 1950 Miss Mary Mahoney has been in charge there. No other New York office is planned by the firm.

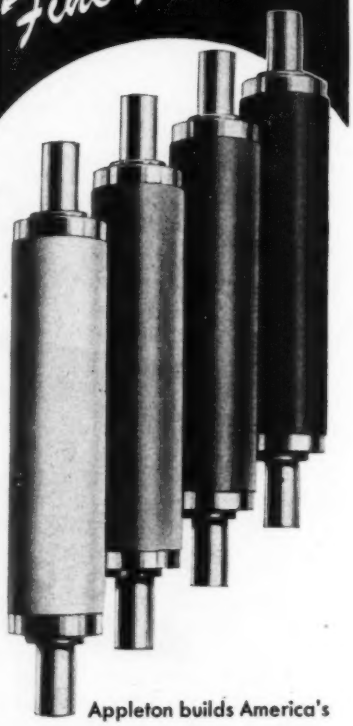
CONSTRUCTION HAS BEGUN on a new plant at Baltimore, Md., being erected for Allied Paper Bag Corp., a division of Oneida Paper Products, Inc. As part of the construction expansion Allied plans to install enlarged research and designing departments in the new plant.

A LARGE CONCRETE BLOCK building at Adairsville, Ga., has been leased to the Utility Container Corp., which will utilize the space for manufacture of boxes and cartons for war materials. Seventy-five persons will be employed initially, but the payroll should be doubled when full production is established.

NEW YORK HEADQUARTERS of APW Products Co., Inc., have been moved to the 12 floor of the recently completed 665 Madison Avenue Building. Former offices at 220 East 42nd Street will be vacated in the near future.

APPLETON SUPER-CALENDER ROLLS...

First Choice for Fine Finishes!



Appleton builds America's finest finishing rolls — available in a complete range of sizes and fillings to meet every finishing requirement.

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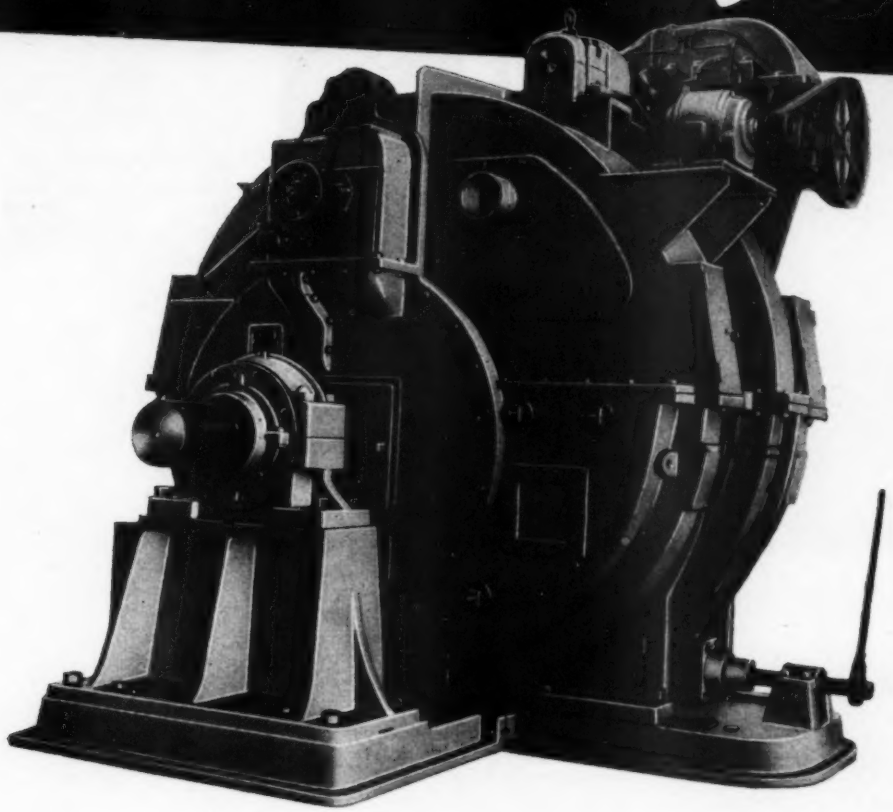
Reduce Your Labor Costs 70%



Another famous *Appleton Machine Company* product, this outstanding modern grinder designed for all grades of groundwood pulp, can cut your operating labor costs up to 70 per cent!

The Roberts Pulpwood Grinder is a continuous, high-speed ring-type machine that replaces 3 or 4-pocket units with resulting economy. High caliber operating means lower cost pulp with less waste. Don't let inefficient, out-of-date equipment eat up your profit margin!

The Roberts Pulpwood Grinder's many operating advantages are outlined in detail in a free bulletin that you can have today. Write now for complete details on this machine and the *Appleton Machine Company's* complete line of paper-making equipment.

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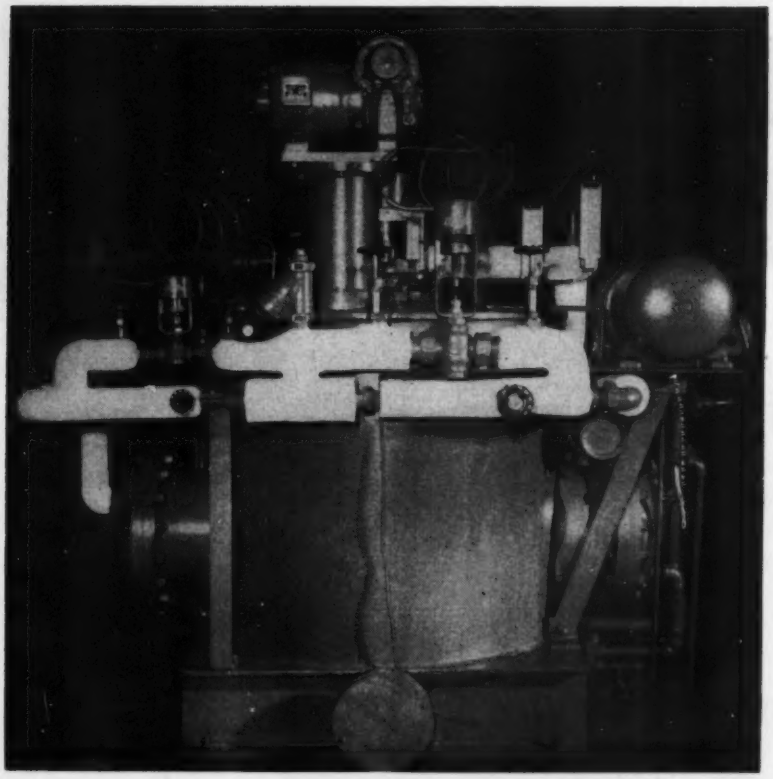
CUSTOM-BUILDERS OF PULP & PAPER MILL MACHINES • WINDERS •
ROBERTS GRINDERS • FINISHING ROLLS • REWINDERS



New Hercules simplified automatic emulsifier

Simplified automatic emulsifier

A new automatic emulsifier for rosin size has been designed to meet the need for a more economical and simplified unit. This new simplified emulsifier, just announced by Hercules Powder Co., is lower in price than the original emulsifying unit introduced by this company in 1948.

This fully assembled emulsifier is the result of several years of experience and technical research in the automatic emulsification of rosin size in paper mills and in the Hercules company's paper research laboratories.

Many new and established paper mills have installed the original Hercules automatic emulsifying unit and are benefiting from reduced labor cost, savings in space requirements, and obtaining rosin size emulsions of greater uniformity of concentration and quality.

The new, simplified unit offers paper mills all of these advantages plus that of lower original cost.

The completely assembled unit requires a space of approximately 6 by 6 feet. When installed, the only labor required for this automatic process is the preventive maintenance customary for comparable mechanical equipment.

Since Hercules introduced automatic emulsification of rosin size, twenty leading paper mills have adopted the process. Two of these represent the new, simplified unit of which many more are scheduled for early installation. The merits of the original automatic unit are still recognized by the paper industry, and several of these units will be installed in the next few months.

Hercules supplies all equipment for the new, simplified unit except the tank car unloading station, and paste size and emulsion storage tanks. Also, the paper mill supplies the necessary piping and wiring. Paper mills may obtain details on layout, construction, and other pertinent information from Hercules' paper mill representatives.

EXPANSION IN CHEMICAL RESEARCH and development has been announced by Chemical Research Associates, Inc., Bernardsville, N.J. Dr. John van Dyk remains president, with Dr. J. Rinse as general manager. A. Rooseboom and Dr. John van der Valk, chemical consultants, have joined the firm and will direct research on petroleum chemicals and natural gas from their office at 10 Rockefeller Plaza, New York.

A THREE STORY ADDITION to the main laboratory building of the Hercules Powder Co. experimental station at the firm's Wilmington, Dela., headquarters, has been completed. The new wing, the major project in a series of expansions made during the past five years, provides 26 new laboratory units accommodating 51 chemists; research facilities of the main building are increased more than 60 per cent. Two new air-conditioned laboratories for the testing of paper and textiles have been constructed.

R-S and S. Morgan Smith Merger Extends Line to Cover Valves of All Sizes

Acquisition of R-S Products Corp., of Philadelphia, by S. Morgan Smith Co., of York, Pa., was effective at the close of the past year.

Statement made at the time of the purchase did not disclose the terms of the purchase; however, it was understood that R-S annual sales have been substantially in excess of a million dollars. At the time of the merger, the company had on its books unfilled orders exceeding $1,250,000.

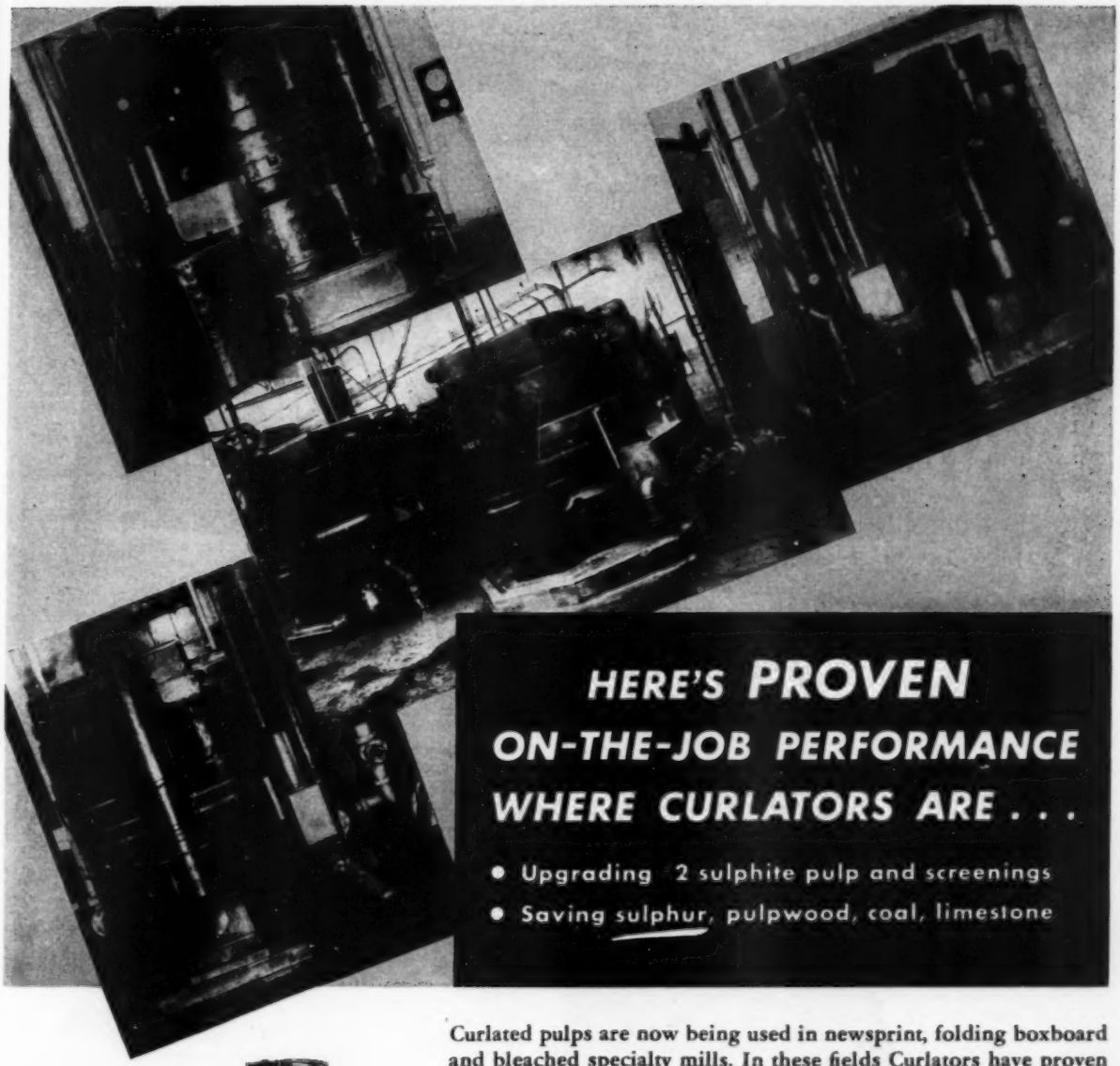
The management of R-S Products Corp. was retained, along with its five-man board, but the S. Morgan Smith Co. will provide two additional board members. There is no change in the operation of the Philadelphia company. The combined operations of the two companies will permit sales of valves of all sizes; the S. Morgan Smith Co. manufactures hydraulic turbines and valves.

New Mathieson Subsidiary Chooses Alabama Site for Chemical Plant

A new wholly owned subsidiary of Mathieson Chemical Corp., Baltimore, Md., the Mathieson Alabama Chemical Corp., will build a chlorine and caustic soda plant near Mobile, Ala., according to an announcement made recently by Thomas S. Nichols, president of both corporations.

Chlorine and caustic soda, two of the most important basic chemicals, are both in short supply. Vital to the expanded mobilization program, both are now under inventory control orders by the Government; a limitation order on the use of chlorine was issued recently by the NPA.

Engineering for the new plant—a 500 to 1000 acre site at McIntosh, Ala., about 40 miles north of Mobile—has been completed. Salt from the McIntosh Salt Dome will supply salt brine, necessary to the manufacture of chlorine and caustic soda. Expected to be operating early in 1952, the new plant—the first



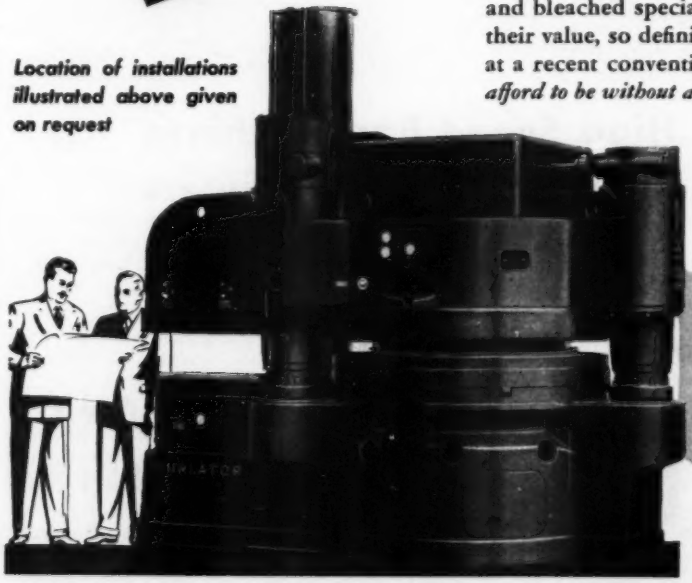
HERE'S PROVEN ON-THE-JOB PERFORMANCE WHERE CURLATORS ARE . . .

- Upgrading 2 sulphite pulp and screenings
- Saving sulphur, pulpwood, coal, limestone

Curlated pulps are now being used in newsprint, folding boxboard and bleached specialty mills. In these fields Curlators have proven their value, so definitely that a sulphite pulp mill executive reported at a recent convention, *"I don't see how any mill in the country can afford to be without a Curlator."* It will pay any mill executive to hear the Curlator story.

Location of installations illustrated above given on request

WRITE *today for detailed information.*



CURLATOR†
Corporation
565 BLOSSOM ROAD · ROCHESTER 10, NEW YORK

†T. M. Reg.—Curlator Corporation, Rochester, N. Y.

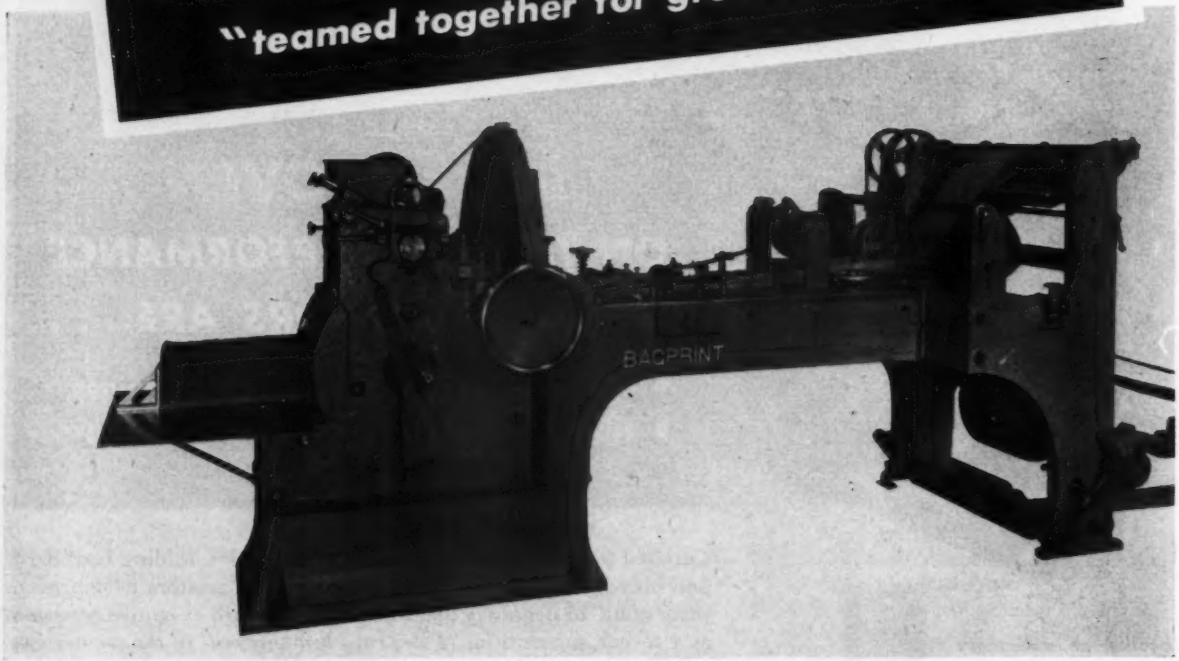
Announcement

BAGPRINT MACHINERY CORPORATION

is now a subsidiary of the

VALLEY IRON WORKS COMPANY

"teamed together for greatest service"



***Improved* Bagprint High Speed Bag Machines**

***Improved* Bagprint High Speed Aniline Printers**

BAGPRINT MACHINERY CORPORATION
A SUBSIDIARY OF

VALLEY IRON WORKS COMPANY

APPLETON, WISCONSIN

PLEASE ADDRESS ALL CORRESPONDENCE TO THE COMPANY AT APPLETON

Mathieson development in Alabama—will use the Mathieson Stationary Mercury Cell process in which brine pumped from wells is broken into its component elements (sodium and chlorine) by passing a direct current through it in a specially designed electrolytic cell.

All chlorine and caustic production of the new company, being built by the Chemical Plants Division of Blaw-Knox Construction Co., Pittsburgh, will probably be consumed in the gulf coast area.

Officers of the new subsidiary are: Thomas S. Nichols, president; John C. Leppart, executive vice president; C. F. Prutton, vice president; Stanley de J. Osborne, treasurer; J. V. Joyce, comptroller; and R. I. Galland, secretary.

New Plant of Lignosol Chemicals Ltd. to Be Ready by September

The new Quebec City plant of Lignosol Chemicals Ltd., is expected to be ready for operation by September 1, 1951. The foundation is in and work on the remainder will begin as soon as weather permits. Estimated cost of the construction and of equipping the new company with working capital will be about $125,000,000.

Lignosol Chemicals Ltd., was formed last fall by Anglo-Canadian, Anglo-Newfoundland Development Co., and Gaspesia Sulphite Co. The plant will be constructed to process waste sulphite liquor from the operations of Anglo-Canadian Pulp & Paper Mills Ltd.

Diamond Magnesium Reopens Painesville Plant

Rehabilitation of a Painesville, Ohio, plant of Diamond Magnesium Corp., a subsidiary of Diamond Alkali Corp., Cleveland, has been entrusted to The H. K. Ferguson Co., also of Cleveland. The plant, originally constructed in 1941 for defense production work and idle since 1945, is being reopened under a government contract which requires that it be in production by April.

Buildings of the plant, where Diamond Magnesium will manufacture magnesium by the electrolytic process, were rehabilitated last year under another government contract; Ferguson's responsibility is to install new materials handling equipment, and restore existing magnesium cells, rectifiers, heating facilities and boilers.

Valley Iron Works Acquires Bagprint Machinery Corp.—Will Operate as Subsidiary

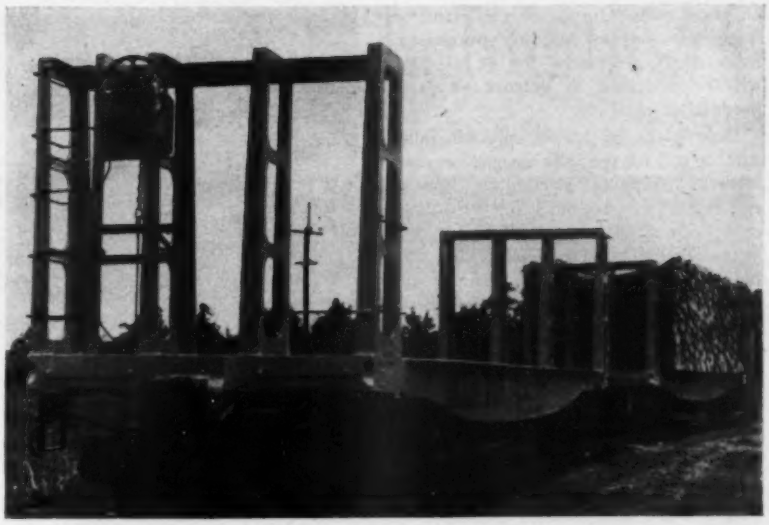
Purchase of the Bagprint Machinery Corp., Royal Oak, Mich., has just been announced by Valley Iron Works, Appleton, Wis. Headquarters of Bagprint, which will operate as a subsidiary of Valley, have been moved to Appleton, but the company will retain a sales office in Royal Oak, Mich. All inquiries for information concerning Bagprint machines and auxiliary equipment should be directed to Bagprint Machinery Corp., a subsidiary of Valley Iron Works Co., Appleton, Wis.

The Bagprint company manufactures high speed specialty flat and square bag machines, aniline printing presses, rewinders and slitters, variable speed electric and mechanical drives. Also included in the Bagprint line are improved high speed aniline printers for use with Bagprint bag machines.

Walter S. Ryan, former president of Bagprint, will remain with the company as sales manager in charge of sales of Bagprint machinery and its allied products. Cliff Laury also will remain as sales engineer for the Central and Southern states, with headquarters in Chicago.

Continuous Rolling Mill to be Built by Dow

A continuous rolling mill, said to be the first such facility anywhere in the world, has been set up in Midland, Mich., by Dow Chemical Co. All magnesium rolling heretofore has been done



Improved pulpwood car permits maximum load with minimum maintenance. Open ends and slatted floors are new features; holds 22 cords.

New G. M. & O. Pulpwood Car

The new type of pulpwood car being constructed in the Gulf, Mobile and Ohio Railroad shops in Mobile, Ala. offers many improvements over the conventional type of equipment. The research on the car was a joint enterprise carried on by the pulp mills in the territory, the General Steel Castings Corp. of Granite City, Ill. and the railroad. When shown to the Southwestern Technical Committee of the American Pulpwood Association, the car was received with great interest because of its increased capacity; but it was also felt that some features needed further testing in use. Among these were the slotted floor which, while it keeps the floor clean, may be damaged by the grapple buckets used for unloading.

Pulpwood logs formerly were hauled on a more or less makeshift type of car, converted from other equipment. The rapid growth of the industry in the Gulf States, however, necessitated designing a piece of equipment for the specific purpose of hauling payloads of wood.

The new car has a sloped and slatted floor that prevents surplus bark from collecting on the floor. A solid cast steel underframe eliminates end bracing and permits an increased load from the usual 13 cords up to 22 cords. The new design also provides for maximum visibility during mechanical unloading, since the ends of the car are open. The lower frame simplifies loading from trucks.

The underframe is designed and built so that the cast steel ends can be set in a pocket and locked and welded in place without the use of rivets. Both construction costs and maintenance are thus said to be reduced to a minimum.

on hand mills. Output of the plant, a large war surplus building purchased from the Government for $1,500,000, will be allocated to defense airplane production.

Dow plans to spend approximately $26,000,000 for specially designed equipment to handle the steel rolling. Other equipment will be built for extruding operations which also will be conducted at the plant. Raw magnesium needed for plant operations will be brought to the plant from a Dow plant at Freeport, Texas, where the firm produces magnesium from sea water.

REGULAR LINES OF GRAPHIC ARTS machinery and equipment will continue to be manufactured by E. C. Atkins and Co., Indianapolis, Ind., although the company's entire steel cutting, creasing and perforating rule manufacturing department has been sold to Zimmers Printers Supply Co., Inc., New York.

New Fiberglas Plant in South for Owens-Corning—McElroy Chosen Project Mgr.

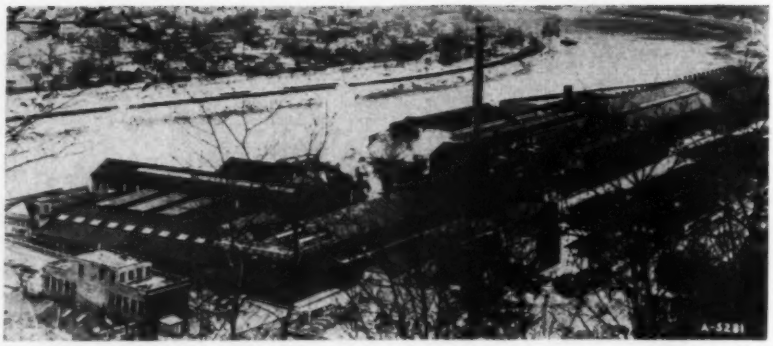
A new plant under construction at Anderson, S.C., for Owens-Corning Fiberglas Corp., Toledo, Ohio, will permit efficient, continuous, one-floor production of Fiberglas yarns. The plant, located on a 130 acre plot and covering 175,000 square feet, will be in production about the middle of this year.

Geo. S. McElroy

The appointment of George S. McElroy as project manager of the Anderson plant has been announced by John H. Thomas, vice president and general manager of the firm's Textile Products Division.

Mr. McElroy, associated with Owens-Corning since 1946, has done extensive technical research work in the development and refinement of Fiberglas yarn production processes. He is now directing the construction and equipping of the Anderson factory, while supervising the training of future key plant personnel now being conducted at Owens-Corning's Newark, Ohio, plant.

Upon his graduation from Princeton in 1937, Mr. McElroy served as an industrial engineer with E. I. du Pont de Nemours & Co., Wilmington, Dela., for two years, and as general production foreman for Rice Barton Corp. Worcester, Mass., for six years; he went to Owens-Corning after Navy service during World War II.



THIS PLANT of National Transit Pump and Machine Co., Oil City, Pa., is now owned by Worthington Pump & Machinery Corp.

Worthington Buys Plant & Equipment of Nat'l Transit and Machine Corp.

Sale of the plant and equipment of National Transit and Machine Corp., Oil City, Pa., to Worthington Pump and Machinery Corp., has been completed. Miscellaneous overflow from other Worthington factories will be diverted to the new property, where William F. Weinreich, former assistant superintendent of Worthington's Buffalo machine shops, will be in direct charge of operations as assistant to Austin C. Ross, vice president of Worthington's Buffalo, N.Y., plant.

The former Transit plant covers 500,000 square feet; facilities include an iron, steel and brass foundry, pattern shop and forge shop, machine shops and assembly floor, test facilities, power house, steel fabricating shop and administration building.

Worthington will furnish repair and spare parts for National Transit Pump and Machinery Co. equipment now in use.

A NEW CHICAGO DISTRICT OFFICE has been established at 53 West Jackson Blvd., Chicago, by Hagan Corp., Pittsburgh, and its subsidiaries, Hall Laboratories, Inc., Calgon, Inc., and The Buromin Co.

EASTERN SALES OFFICES of The Dorr Co., formerly at 570 Lexington Ave., New York, were moved December 15 to the company's general offices at Barry Place, Stamford, Conn. A branch office will be continued at the former New York address.

NO MAJOR PERSONNEL CHANGES will result from the recent merger of Barrett-Cravens Co., Chicago, and The Crescent Truck Co., Lebanon, Pa. Under the merger, Crescent will operate as a division of Barrett-Cravens, with engineering and manufacturing operations being continued at Lebanon and sales operations transferred to Barrett-Cravens headquarters.

TWO NEW BRANCH OFFICES have been opened by The Howe Scale Co., Rutland, Vt., bringing the total of such offices to 20. At Denver, Colo., Daniel O. Ferris is in charge of the new office at 2524 Walnut St. The new Houston, Tex., office, located at 2215 McKinney Ave., is managed by Henry K. Leonard.

A NEW MANUFACTURING PLANT will be built at Tupelo, Miss., by The Rockwell Manufacturing Co., Pittsburgh. The 150,000 square foot factory will employ approximately 300 people, most of whom will be hired locally.

NOW EXCLUSIVE WAREHOUSE DISTRIBUTOR of Rockrite tubing manufactured by Tube Reducing Corp., Wallington, N.J., Joseph T. Ryerson & Son, Inc., Chicago, is handling a comprehensive range of sizes of Rockrite tubing for hydraulic cylinder applications.

SEVERAL SITES ARE BEING CONSIDERED as the location of a $4,000,000 plant being planned for the production of elemental sulphur and sulphuric acid by Noranda Mines; one proposed location is Hamilton, Ont., Canada. Upon the final choice and establishment of the location, pyrite will be shipped to it at the rate of more than 300 tons a day, making it possible to make approximately 100 tons of sulphuric acid and about 50 tons of sulphur daily.

NEWLY ADMITTED TO MEMBERSHIP in The Electric Industrial Truck Association is Clark Equipment Co., Battle Creek, Mich.

The Paper Industry Pictured Highlights

WM. H. BRYDGES, past president of the Superintendents Ass'n, has been named Man-of-the-Year for 1950 by the Boonsboro (Va.) Ruritan Club. Although in retirement, "Bill" has become a leader in his community.

NORWEGIAN pulp & paper mill management and labor representatives inspect machine at Nekoosa-Edwards Paper Co. plant, Port Edwards, Wis. In extreme right foreground are Nepco employees: Alex Konopacki, machine tender; Ray Vechinsky, P.M. supt.; Joe Smart, tech. asst., and N. H. Christian, operating supt. The Norwegian visitors are on an ECA-sponsored tour of U.S. paper mills.

GIFT FROM WASTEPAPER INSTITUTE is accepted by C. B. MacDonald, comptroller of Western Michigan College, Kalamazoo, Mich. Contribution was obtained through efforts of O. W. Callighan (center) ch. of Laboratory Equipment Committee. H. C. Pearson (right), sec'y of Pioneer Paper Stock Co., Kalamazoo, presented check.

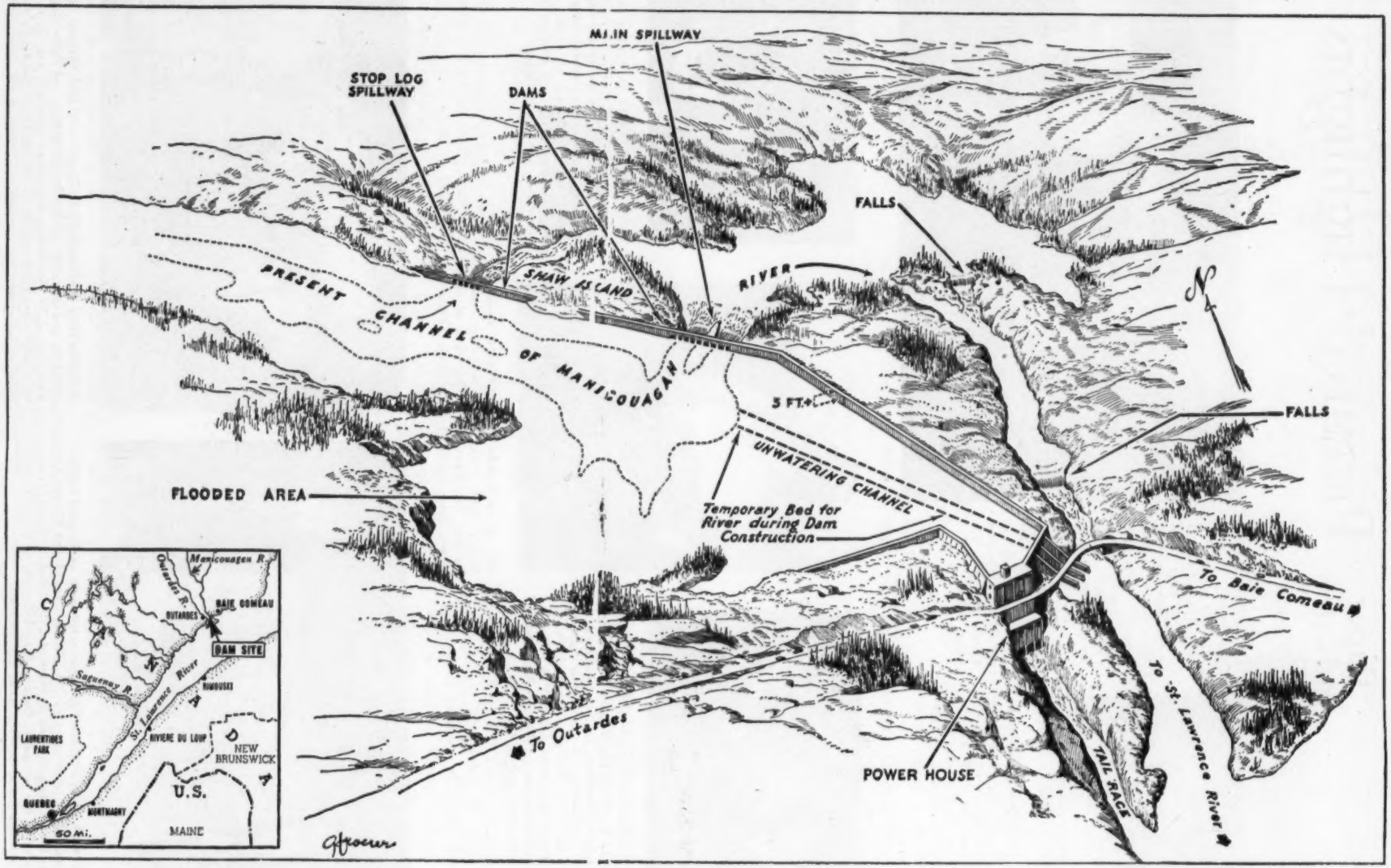
MR. & MRS. FRANK W. EGAN, aboard Italian Liner "Vulcania" returning from Europe. Mr. Egan visited European plants where Egan machines have been installed.

FROM THIRD HAND on a paper machine to gen. supt. of Whiting-Plover Paper Co., Stevens Point, Wis., is the record of Albert W. Tech. He is shown just after receiving a scroll from A. J. Schierl, gen. mgr.; he was honored with a party and gifts on his 50th anniversary with the company.

COMPANY ACHIEVEMENT in labor relations is recognized by the Lockland, Ohio, employees of The Gardner Board and Carton Co. Plaque shown was presented by them to Colin Gardner (right), exec. vice pres. of the company. George Bradford (left) of C.I.O. United Paperworkers (local union), made presentation.

A WORKING MANAGEMENT TEAM . . . . E. J. Gaynor III (left), vice pres. and gen. mgr. of the Brunswick Pulp and Paper Co., Brunswick, Ga.; J. W. McSwiney, asst. treas. (center); and G. K. Singletary, plant mgr., break ground for foundation of company's new office building, scheduled for completion in May of this year.

Site of proposed power project to be built by paper company near Baie Comeau



Drawing of plan for dams and powerhouse on the Manicouagan River in Quebec to supply power for the Quebec North Shore Paper Co. The project will by-pass wild falls which have a flow that, in flood, can reach a greater volume than that of Niagara. Operating on a 125-ft. head of water, the power plant will furnish electricity to paper mills and communities

Huge power project planned for Quebec North Shore Paper Co.

Paper company engineers find way to harness "wild falls" . . . . potential power volume greater than that of mighty Niagara

EUGENE GRIFFIN

(Chicago Tribune Press Service)

▶▶▶ AN UNTAMED WATERFALL which can pack the cataract punch of Niagara is to be harnessed by means of a unique enginering feat in the rugged north shore country of the St. Lawrence River.

The wild falls, called simply the First falls, are on the flashy Manicouagan River, which flows thru the timber limits of the Quebec North Shore Paper Co., which makes newsprint paper for *The Chicago Tribune.*

Largest river entering the gulf of St. Lawrence east of the Saguenay River, the Manicouagan rises in a barren northern tundra. This makes it dangerously responsive to "flash" floods, an engineering challenge which is encountered to the same degree on few of the world's rivers.

Can Reach Greater Volume

Under flood conditions, Niagara falls has a flow not in excess of 300,000 cfs. Flood flow on the Manicouagan can reach a greater volume. Engineers preparing to construct the first power dam on the Manicouagan have anticipated a flood of 360,000 cfs.

On the site chosen by the paper company engineers for the hydro-electric development, nine miles west of Baie Comeau, the Manicouagan pours turbulently through a narrow valley, is deflected by a rock formation for about 1,000 feet, and then rushes thru a long narrow gorge. At the head of the gorge is a rock island.

The engineering problem was to provide a dry bed for the dam foundations. Unusual risks from flash floods would be incurred in construction of cofferdams, the normal procedure. The river bottom contours have been found too uneven, and the water depths too great, for cofferdams.

Risk Is Too Great

A spectacular scheme was studied, that of dropping a 15,000 ton precast concrete obelisk, 100 feet high and 60 feet wide, into the river. Again the risk was too great.

The paper company engineers now have decided on the way they will tame the river. Construction will be started in the spring on an unwatering channel, which in effect will mean the digging of a temporary river bed to divert the stream for about six months while the dams are built on dry land.

It will be the largest complete unwatering channel operation on record, in the opinion of the engineers who have planned it. The channel will be 1600 feet long, as deep as 115 feet, and its minimum width will be 40 feet. About 400,000 cubic yards of granite rock will be excavated from the immense trench, on which about 1500 men will be employed next summer.

Build Scale Model

To eliminate risks and to indicate what requirements might be encountered in the intricate project, the engineers built a hydraulic scale model of the river and power site, about 40 feet long by 30 feet wide, representing a scale of 1 foot to 200 feet horizontally and 1 foot to 50 feet vertically.

Accurate contours of the Manicouagan river bed and valley were molded in sand to proper scale, and covered with concrete. Tests of flows at various river stages, up to the equivalent of a flood tide of 360,000 cubic feet per second, were studied for 12 months before the final engineering plans were decided. The model proved of great value in the design of the dams and power house.

Maximum height of the dam above rock foundation will be 97 feet.

Five Feet Above Level

To give an allowance of protection against waves, the top of the main dam wall will be 5 feet above the raised water level, except that a special spillway section will be constructed in the main dam 1 foot above the normal head pond level to prevent flood waters from overflowing near the main power house and public highway.

This spillway was decided upon after study of the operation of the model dam under simulated flood conditions.

The total head, or drop of water, to be used in generating power will be 125 feet from forebay to tail water.

The first generating unit will produce 50,000 hp.

Will Supply Reserve

This power will supply a reserve to safeguard the paper company's operations, and will provide electricity to the small communities that are gradually growing on the north shore as a result of the pioneer development of this part of Quebec province by the paper company at Baie Comeau.

There are no nearby transmission lines of any large power company in the area. The present power supply for the Baie Comeau mill is obtained from the company's own power development on the Outardes River.

The first unit of the Manicouagan development will be in operation in 1953. Power from this unit, when not required for other purposes, will be utilized to replace coal to generate steam for the paper mill. The installation of any additional generator at the site will depend on future demands for use of power in this section of Quebec, according to Arthur A. Schmon, president and general manager of Quebec North Shore Paper Co., parent company of the Manicouagan Power Co.

M. H. Jones, chief engineer of the Ontario Paper Co.; Charles Miller, the company's manager of construction, and William Eliason, chief electrical engineer, are among those who are in charge of the Manicouagan project. H. G. Acres & Co., of Niagara Falls, Ont., a noted hydroelectric power engineering firm, are the consulting engineers.

This article was first published in the *Chicago Tribune* (Jan. 26). The article and map are reproduced here with full permission of the *Tribune.*

Balloon-like chamber or "isolarium" at the Institute of Paper Chemistry's Container Laboratory

Collapsible chambers for temperature and humidity control

W. DOUGLAS BEERS
Technical Associate
The Institute of Paper Chemistry

▶▶▶ TO MEET THE NEED for work spaces and storage spaces with a wide variety of controlled temperatures and humidities, The Institute of Paper Chemistry has developed balloon-like chambers having many unique and useful features. Such an "isolarium," as it is called, is easily erected, collapsed, and re-erected according to the need. Collapsed, the envelope is easily transported and may be stored in a small space. When the envelope is made from a transparent film, exterior lighting may be sufficient for the activities within. An erected isolarium and a collapsed envelope of similar dimensions are shown in Figure 1.

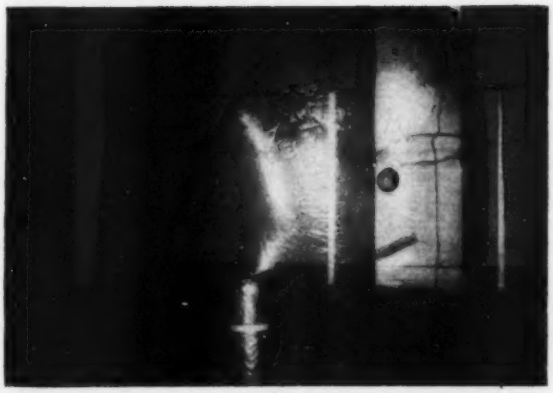
In a retractable, protruding pocket open only to the inside of the chamber, test specimens may be placed in the jaws of a tensile or compression testing machine without the machine being within the isolarium and without removing the specimens from the chamber. This is particularly helpful when a large testing machine is simultaneously needed for testing at two or more air conditions. The use of such a pocket for the compression testing of shipping containers is shown in Figure 2. The container shown is being tested at a relative humidity of 90 per cent and a temperature of 73 F. in a compression testing machine which is also available for testing at 50 per cent relative humidity at 73 F.

What is it made of

Each isolarium consists essentially of an envelope made of a light, highly flexible sheet material which is strong enough in relation to its weight so that the envelope may be supported by internal air pressure without bursting. The envelope can be composed entirely of the sheet material or can be composed partly of floor, ceiling, or walls of more common construction by fastening the sheeting to such surfaces. However, where the entire isolarium is fabricated from the light, flexible sheet material, the erection-collapse-re-erection advantage is more pronounced. The floor film of the envelope may be protected by placing double-faced corrugated paperboard beneath and above the film.

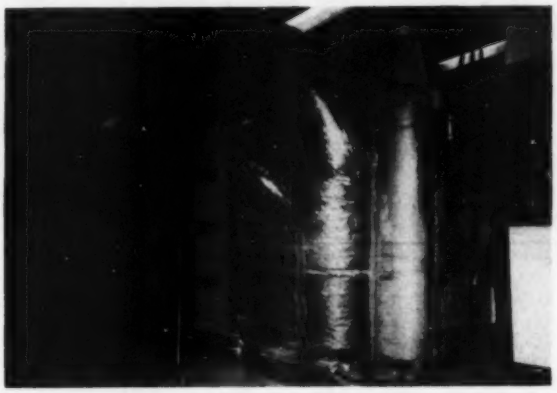
In addition to transparency, lightness, flexibility, and strength, several other properties frequently are desirable in the sheet material from which an isolarium is made. These include (1) easy sealability, to facilitate tight and inexpensive fabrication, and (2) high resistance to the exchange of water vapor and air between the enclosed and the ambient spaces. Tight fabrication and high resistance to the exchange of water vapor and air are particularly important when an isolarium is operated in a room where close control at a different air condition is required.

The relatively low resistance to heat transfer afforded by the thin film may in some cases be advantageous but in other applications might lead to condensation and other problems. The problems might be overcome by placing one or more larger envelopes around the isolarium and maintaining the air between the envelopes at the temperatures and humidities most compatible with the enclosed

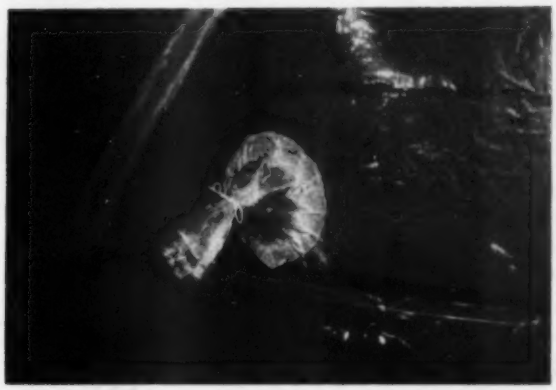


1—Isolarium can be deflated and collapsed into small package

2—Compression testing a shipping container in isolarium pocket



3—An air-lock (closed with zippers) entrance to an isolarium



4—Sleeved hand hole is closed off by binding with string

and ambient spaces. For instance, if the isolarium were to be maintained at a relative humidity of 90 per cent and a temperature of 80 F., with an ambient temperature of 60 F., a considerable condensation problem might be encountered with a single envelope. Surrounding the isolarium with an envelope of air maintained at temperatures above 77 F. and dew points below 60 F. would overcome this condensation problem.

Many of the thin, flexible sheet materials otherwise suitable for use in isolariums are highly flammable. When burned under certain conditions, some materials emit deadly poisons. These hazards should be given due consideration in the selection of the material from which an isolarium is to be made. The effects of humidities, temperature, and light should also be considered in the selection of material. Some of the otherwise suitable materials contain volatile plasticizers and become brittle when the plasticizer is lost. Such a material might not be sufficiently durable for certain applications.

How it works

An isolarium is erected by merely inflating the envelope. The slight pressure required to support the weight of the envelope may be maintained by means of a small blower. The inflation of the erected isolarium shown in Figure 1 was being maintained by a ½-inch-diameter hole in the duct beside it, which was delivering air to the room in which the isolarium was erected. Should the blower used for pumping air into a "self-supported" isolarium fail, the weight of the envelope would serve to maintain enough internal pressure to prevent infiltration from the ambient space for a considerable period of time, during which the blower might be returned to operation.

To provide for the passage of persons, material, and equipment to and from the enclosed space without excessive deflation, an air lock might be fastened around the entrance. Such an air lock is shown in Figure 3; the air lock is operated in much the same manner as is a common water lock. Cloth-mounted "zipper" fasteners cemented to slits in the sheet material have been found to serve nicely for opening and closing the passageways. To allow opening of the passageway from the inside as well as from the outside, the slide of the "zipper" fastener should have an operating tab on each side.

To provide for the passage of hands and arms and of small objects to and from the enclosed space, a sleeved hand-hole might be installed at an appropriate place in the envelope. The hole may be closed by binding the sleeve with a piece of string. A sleeved hand-hole used to admit the hand and arm for a manual sling psychrometer determination is shown in Figure 4. Similar sleeved openings have been found to be useful for attaching air pipes and for admitting electrical extension cords. On a larger scale, such openings might serve in place of the "zipper" fastened passageways previously suggested.

Although these isolariums are relatively inexpensive, easily erected, moved, stored, and re-erected, and although they generally provide a minimum of air and moisture exchange between the enclosed and ambient spaces, the air conditioning and control equipment required for a given application would be much the same as that used with conventional constructions. (In instances where there are large temperature differentials between the enclosed and ambient spaces, the cooling or heating facilities required might be of higher capacity than would be required for a well-insulated chamber.)

In general, air of the desired composition and temperature may be introduced

at the desired rate, distributed in the desired manner, and removed at such a rate that the isolarium remains inflated. The enclosed air may be caused to flow at the desired rate in the desired paths and may be adjusted as desired with respect to temperature and composition.

How one was designed

Design of the air conditioning and control equipment to be used for the isolarium depends, of course, on the conditions which are to be maintained in the envelope, on the moisture and heat gains and losses encountered, and on the water, steam, gas, compressed air, electric, and other services available. For instance, it was desired to maintain one 13 x 9 x 9-foot isolarium at 90 per cent relative humidity and 73 F. in a room already controlled at 50 per cent relative humidity and 73 F. Electric power, 15 psi pneumatic control air, low pressure steam, and 52 F. water were available.

The desired air conditioning and control were obtained with a vertical, cyclonic spray chamber and a steam injector. By means of a fan, air was drawn from the envelope through screened holes in a ring of stove pipe (easily available in diameters up to 7 inches) on the perimeter of the floor of the envelope. The fan was outside of the isolarium. Operating at a static pressure of about 1.2 inches of water, the fan delivered about 750 cfm of air tangentially at the bottom of the 24-inch diameter, vertical, cyclonic spray chamber.

From a centrifugal spray nozzle centered about 20 inches above the tangential air inlet, 52 F. water was sprayed downward against the air stream. A similar nozzle was situated about 20 inches above the first. The two nozzles delivered a total of about 10 pounds of water per minute. The water collected at the bottom of the spray chamber was continually drained. About 12 inches above the second nozzle, dry steam was injected from a trapped condensate separator. The amount of steam injected was controlled by a pneumatic diaphragm valve operated by a humidistat having its sensitive element at a hole in the return air duct within the envelope. Just above the level of the steam injection, the 24-inch diameter was tapered to a 12-inch diameter elbow through which the air was delivered to the top of the isolarium.

Although no conventional spray eliminators were used, the air delivered was free of water droplets. It is believed that the cyclonic movement of the air through the spray chamber resulted in the entrained water droplets being deposited on the walls of the spray chamber, particularly in the region of the taper atop the chamber.

The inflation of the envelope was accomplished by allowing some ambient air to enter on the suction side of the fan. When the inflation was complete, the internal pressure required to support the envelope was maintained by manual balancing of the make-up air and the vented air. Because the ventilation was small, the venting was adjusted by means of the "zipper" fasteners in the passageways. If large amounts of ventilation had been used, it might have been advisable to install a separate vent with a barometric damper exhausting near the return-air pickups of the air-conditioned room outside of the envelope.

Other applications

In other applications at The Institute of Paper Chemistry, one isolarium has been used to enclose air at 85 F. temperature with an ambient temperature of 73 F. In another isolarium, 60 F. air was enclosed against an ambient temperature of 40 F. In both these installations, circulated air was heated with electrical heating coils. Temperature control was effected by the use of thermal-electric switches. In these applications, the air-circulation systems were entirely within the envelopes.

Although there has been no occasion to incorporate refrigerators or driers in the air-conditioning units for the isolariums, it seems likely that such equipment could be adapted with little difficulty. It is expected that, because of their wide versatility and relatively low initial expense, these isolariums may be especially suitable for use in laboratories having little or no work space or storage space maintained at the humidities and temperatures which are ideal for their particular activities. The isolarium may be useful in other applications as well as those involving air conditioning.

Wood waste in the South

▶▶▶ A STUDY OF 15 pine sawmills in northern Louisiana and southern and central Arkansas has been conducted by R. D. Carpenter of the Southern Forest Experiment Station in co-operation with the Southern Kraft Division of International Paper Co.

The results of this study as released by the Forest Service, U.S. Dept. of Agriculture, Southern Forest Experiment Station in New Orleans, reveal some interesting facts. A digest of this data is given here:

If the bark is removed before the logs are sawed, most of the waste is suitable for pulp chips. In all mills, the larger the log the less the waste per thousand board feet of lumber sawed. The average amount of waste suitable for pulp chips increased more or less regularly as log diameter decreased. Thus logs 23 inches in diameter produced about 0.3 cord of waste per thousand board feet (green lumber tally) of lumber sawed, while 6-inch logs had about 0.8 cord of waste per thousand feet of lumber.

Mills were divided into four classes according to their sawing equipment. Classes ranged from large mills with a band headsaw and resaw (class 1) to small portable mills with inserted-tooth circular headsaws and no resaw (class 4).

For logs of most diameters, class 2 mills (solid-tooth circular headsaw with resaw and shotgun feed) produced less waste than mills of other classes. Class 4 mills had somewhat more waste than other mills in logs between 7 and 15 inches in diameter.

Mills in classes 1 and 2 usually got the most lumber from a log of given diameter, apparently because they had thinner headsaws as well as band resaws, and therefore cut less kerf (class 3 mills had a solid-tooth circular headsaw, steam feed, but no resaw).

For their total 1948 output, mills in classes 3 and 4 produced 0.61 cord of chippable heavy waste per thousand feet of lumber output. Class 1 mills produced 0.43 cord and class 2 mills 0.46 cord. It was found that mills in classes 2, 3, and 4 get 95 per cent of their annual cut from logs under 16 inches in diameter. Class 1 mills get only 82 per cent of their cut from logs of this size.

In 1948, the average study mill in class 1 or 2 cut about 8,000 thousand board feet of pine lumber and thus produced about 3,500 cords of chippable waste during the year. Class 3 study mills, with an average cut of 4,800 thousand feet, had 2,900 cords of chippable waste. Class 4 mills averaged 4,000 thousand feet of lumber and 2,400 cords of waste.

Fork truck operator calls central dispatcher for his next assignment—operations are speeded up and lost motion eliminated

Central contains a master short-wave station linked to all trucks

Two-way radio aids fork truck operation

▶▶▶ TWO-WAY RADIO SETS on fork trucks are the latest wrinkle devised by materials handling engineers to cut costs. Wasted time and traveling without loads are slashed by up-to-date communications. This technique accomplishes two purposes: it keeps industrial trucks busy carrying payloads, instead of wasting time deadheading; and it moves them to busy spots where they are needed without a wasted minute.

One firm putting the idea to work is Johnson & Johnson, whose new shipping center at Metuchen, N. J., utilizes fork lift trucks equipped with two-way radio sets. The J & J operation involves receiving goods from its production plants, moving them to reserve areas, or the order picking floor, and to loading docks for shipment to customers. Rail and highway transportation is used.

Internal handling, except for a dragline operating in the order picking area, is by a fleet of seven Skylift electric fork trucks, 2000 pound capacity, made by Automatic Transportation Co.

Here's how the operation was set up by Bob Bradley, foreman, and Bill Conover, industrial engineer:

Two-way Motorola short wave radio sets were installed on each of the fork trucks. They are placed to the right of the driver's seat, and are easily accessible. All sets, plus the master station from which all orders emanate, are on the same frequency. Thus, every driver hears all messages, and can better orient himself to the entire operation.

A master short wave station is located in central dispatching headquarters, which is both the voice and brain of the materials handling system. Included are a space layout chart and stock record location cards. The dispatcher knows where all merchandise is, can keep up to the minute on the positions of his fleet, and is able to shift trucks and goods with exceptional speed.

Deadhead loads, idle time, waiting for a pallet load, and general confusion, are eliminated. Another saving is in paperwork. In the past, assignments were worked out in advance, put on paper, and handed to the driver, who proceeded on his own from that point. With verbal orders, given one at a time, the paperwork is not needed.

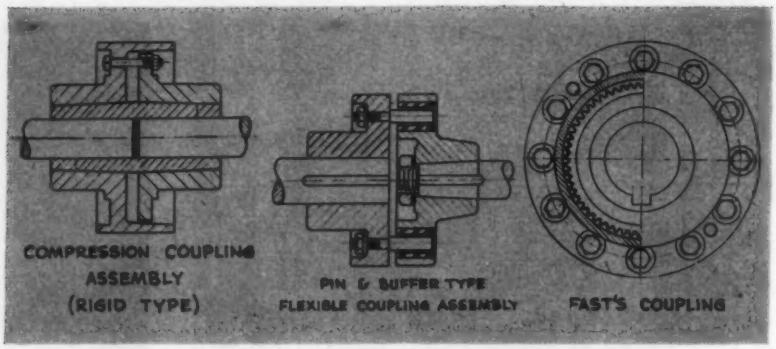
A typical operation might start with a driver picking up a pallet load of cartons at the receiving dock. He calls the dispatcher to learn where to take it, and is told the exact spot. In a matter of seconds, he is en route.

When finished, he calls for his next assignment, or possibly he has heard from "central" already. Again, no waste. He's off to the next job, the nearest one that needs to be done. Before the radio system was installed, drivers often traveled as far as 600 feet without a load to get their orders.

The same technique applies throughout. Whether an operator be headed for the reserve storage area, the order picking floor, or the incoming or outgoing docks, there's no problem. He'll go to the correct shipping door, for instance—the one where his load is waiting—and he won't be delayed while several other trucks pick up their pallet loads.

For Johnson & Johnson, the radio equipment and its installation cost $3200. The operation is too new for time study figures to tell how rapidly savings achieved by the radio-electric truck combination are paying for the communications system. However, the dollar benefits are appreciable, and already indicate a considerable accomplishment.

That the system can be profitable for plants smaller than J & J's 207,000 square feet seems certain. Space and distance are not the only determining factors; more important is the amount of production time that can be saved.



Centrifugal Pumps . . .

couplings and bedplates

IGOR J. KARASSIK and ROY CARTER
Application Engineers
Worthington Pump & Machinery Corporation

Part II of a series

▶▶▶ WHILE A FLEXIBLE coupling is most commonly used to connect a pump shaft to its driver shaft, practically all types of couplings and clutches have been used in conjunction with centrifugal pumps.

Rigid Couplings

A coupling which permits no axial or radial relative motion between the driving and the driven shafts is called a rigid coupling. It solidly connects the two shafts, making of them, in effect, a single shaft. Its use is primarily restricted to vertical pumps.

Clamp coupling—A clamp coupling is a rigid coupling, consisting basically of a split sleeve with bolts so it can be clamped on the adjoining ends of two shafts forming a solid connection.

Keys, both axial and circular, are commonly incorporated so the transmission of torque and thrust is not solely dependent upon the frictional grip.

Compression coupling—A compression coupling is likewise essentially a rigid coupling. The central portion of the coupling is made up of a slotted bushing bored to fit the two shafts and taper-machined on its outside diameter from the center out to both ends. The two coupling halves themselves are finish bored to suit this taper. When drawn together by bolting, the bushing is compressed to the two shafts and the frictional grip transmits the torque without the use of keys.

Flexible couplings

A flexible coupling is a connecting device joining the ends of two shafts, capable of transmitting torque from one shaft to the other and of a design that permits proper transmission of the torque with minor misalignment, angular, parallel or both, of the shafts. However, while flexible couplings will take care of slight errors in alignment of shaft centers in emergencies, such a condition must not be tolerated permanently. Misalignment causes whipping of the shaft and added thrust on the bearings, causing excessive maintenance or possible breakdown.

Pin and buffer couplings—A pin and buffer coupling is a flexible coupling having pins attached to one half of the coupling projecting into buffers, mounted in the other half of the coupling on the other shaft. The buffers are made of rubber or other compressible material, to give flexibility. The driving bolts have an easy sliding fit in the bushings and, therefore, slight longitudinal variations are taken care of by the sliding action of the bolts within the bushings, while slight errors in angularity are taken care of by the flexibility of the rubber.

All-metal flexible couplings—An all-metal flexible coupling is one of which all parts are made of metal. Some of these depend on the flexibility of metal plates or springs while others depend upon angular displacement possible with a spline and have two splines with a connecting splined sleeve.

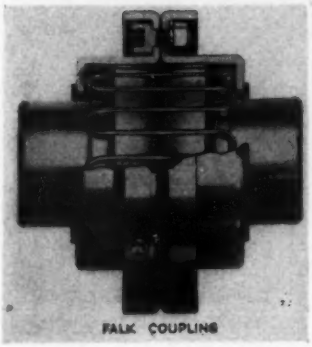
In the outer shell of the fast flexible coupling, inside of each end, there is a ring of internally cut gear teeth which mesh with the gears on the driving and driven halves of the coupling respectively. The torque is transmitted through the gear teeth, the permissible sliding action and ability for slight adjustments in position being provided by a certain freedom of action between the two sets of teeth. To prevent any tendency to bind due to friction, the gears work in a constant bath of oil which is retained within the outer shell.

Another type is the Falk flexible coupling, which is an all-metal coupling with grease lubrication. It consists of two flanged steel hubs, a special tempered steel spring forming a complete cylindrical grid and a steel shell cover. The peripheries of the hubs are slotted to receive the spring member. The slots widen inwardly towards each other. This widening is in the form of an arc, bearing a definite relation to the thickness of the grid spring bars. The curvature is such that the points of support approach each other as the load increases. In fact, the slots are so formed that the stress on the spring members remains almost constant throughout the entire elastic range of the coupling.

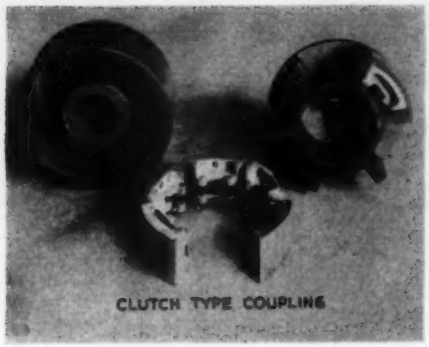
There are numerous other types of all-metal flexible couplings, each with its own virtues and advantages.

Extension type couplings—An extension type coupling is a flexible type coupling consisting of two single engagement elements connected by a sleeve. This gives, in effect, the equivalent of a short floating shaft or flexible shaft drive and will compensate for more misalignment than a regular flexible coupling. Extension type couplings are commonly used on pumping units handling hot liquids when expansion may result in misalignment. They are also used in conjunction with end-suction pump designs in which the rotor and bearing

Material from this article will be included in a book on centrifugal pumps now being prepared by the authors; hence, all rights to republication are reserved by the authors.



FALK COUPLING



CLUTCH TYPE COUPLING

FLEXIBLE SHAFT DRIVE

assembly are removed by drawing axially towards the driver. For such application the connecting sleeve joining the two elements must be easily removable and of sufficient length to give the required clearance between the shaft ends to allow withdrawal of the rotor and bearing assembly.

Couplings for dual drive

In dual driven pump installations, it is generally desirable to have one driver idle while the other is in operation to save power as well as wear on the idle machine. In case of internal combustion engines, the engine could not be allowed to turn over idle and must be disconnected. The ideal type of couplings for such units is that which can be readily disengaged and engaged. Where time is of extreme importance, or when the starting of the standby driver is automatically controlled, a device of the free wheeling clutch type is necessary.

Clutch type couplings

Regular disc-type clutches are rarely used to connect a centrifugal pump to its driver for two major reasons. The *first reason* is that most clutch designs impose a high additional thrust load on the pump thrust bearing while the *second reason* is that very accurate alignment between the clutch parts is necessary and this is difficult to maintain. The overrunning clutch design has been used to connect drivers to pumps, particularly for dual driven units, and the most successful designs have a flexible coupling incorporated into the clutch unit. A clutch type coupling utilizing faced weights which are contained in the driver half and which are pressed against a drum surface on the driver half by centrifugal force, is also used.

Magnetic and hydraulic couplings

Magnetic clutches are also rarely used to connect a centrifugal pump to its driver. This device requires accurate alignment and a few installations that have been made have not been very successful and have had high maintenance costs.

The only application in which a magnetic clutch could be used to advantage in connection with pump drive is the pumping into accumulator tanks or similar service where the demand varies over a wide range. It is now the practice either to start and stop the entire pumping unit or, if the cycle is too frequent for that, to allow the pump to operate at reduced capacity during the period of small demand, incorporating, if the demand will at times become too small for proper operation, a bypass so the capacity never falls below a safe value.

Both hydraulic couplings and magnetic drives are used with centrifugal pumps where variation in operating conditions warrant the use of these variable output speed devices. While they have approximately the same over-all efficiency as slip ring motors with speed control, they have the advantages of easily producing any desired output speed while the regular control for slip ring motors only permits adjustment of speed by steps.

Flexible shaft drive

In some installations considerable misalignment between the pump and driver shafts can be expected and the connecting device consists of two universal joints, or flexible couplings acting as universal joints, joined by a floating shaft. One commercially available type using universal joints also provides for variation in the distance between the ends of shafts and is called a flexible shaft drive.

Coupling guards are stationary enclosures surrounding a coupling. They are sometimes furnished with pumps connected to their driver by means of a coupling in order to protect the operator from the possible danger of getting caught by the revolving coupling. They are usually made of steel mesh or steel plate and are fastened to the bedplate or to the pump foundation in the absence of a bedplate.

Bedplates

It is desirable that pumps and their drivers be removable from the place where they are mounted. For this purpose, they are generally bolted and doweled to machined surfaces firmly connected to the foundation. For simplicity of installation, these surfaces are usually part of a common bedplate on which the various parts of the equipment have been aligned at the time of manufacture.

The primary function of a pump bedplate is to furnish mounting surfaces for the pump feet which would be rigidly attached to the foundation. Mounting surfaces are also necessary for the feet of the pump driver or drivers or any independently mounted power transmission device used to connect the driver to the pump. While such surfaces could be provided by separate bedplates or by individual planed surfaces under the individual feet, it would be necessary to align these separate bases or surfaces and fasten them to the foundation with the utmost of care. Generally this would require mounting them in the field, in place, as well as drilling and tapping for the holding down bolts after all the parts of the unit have been aligned. To minimize this "field work" most pumps are purchased with a continuous base extending under the pump and its driver and these are both usually mounted and aligned at the pump manufacturer's works.

While such bases are designed to be quite rigid, they deflect when improperly supported. It is, therefore, necessary to support the base on its foundations so that the latter supply the required rigidity. Furthermore, since the base can be sprung out of shape by improper handling during transit from the place of manufacture to its point of installation, the alignment must be carefully checked during erection and prior to starting the unit.

As the size of the unit is increased, the size and weight of the base required under a pump and its driver increase as does its cost. In most large units the cost of such a base exceeds the cost of the field work necessary to align individual bedplates or soleplates and to mount the component parts of the unit

on these supporting surfaces. In such cases, it is cheaper to omit the base and extended bases are only used on such units when appearances or the need for utilizing the base as a drip collector justifies the additional cost.

Even for fairly small units there are cases when there exists a considerable difference in the height at which the feet of the pump and of the other elements of the unit are located. In many such cases, a more rigid and pleasing appearing installation can be obtained by using individual bases or soleplates, building up the foundation to various heights under the various separate portions of the equipment in question.

Cast iron baseplates are generally provided with a raised edge or "raised lip" around the base, to prevent dripping or draining onto the floor. The base itself is suitably sloped towards one end so as to collect the drainage for further disposal. A drain pocket is provided near the bottom of the slope and is generally furnished with a mesh screen. A tapped connection in the drain pocket permits piping the drains to a convenient point.

Bedplates fabricated of steel plate and structural steel shapes are now used extensively. Such a type of bedplate does not easily permit the incorporation of a raised-lip or drip pocket. From a utility viewpoint, the usual design of pump with bearing brackets forming drip pockets to collect leakage from the stuffing boxes now makes the use of a raised lip bedplate unnecessary except for cases where a pump handling a cold liquid is installed in a moist atmosphere, thus causing considerable condensation on its surface.

Soleplates

Soleplates are cast iron or steel pads located under the feet of the pump and/or of its driver. They are embedded into the foundation and the pump and/or its driver are doweled and bolted to them. Soleplates are generally used for some of the larger units in order to save the cost of the large bedplates which would be required for such units.

Centerline support

For operation at high temperatures it is necessary that the pump casing be supported as near to its horizontal centerline as possible, in order to prevent excessive strains due to temperature differences which might otherwise seriously disturb the alignment of the unit and cause eventual damage to the pumping equipment. This type of construction is generally employed for refinery pumps which frequently handle hydro-carbons at high temperatures as well as for heater drain and boiler feed pumps operating at temperatures approaching or in excess of 300 F.

Paper mill safety is just HORSE SENSE

DWIGHT J. THOMSON

Vice President and Director of Industrial and Public Relations
The Champion Paper and Fibre Co.

▶▶▶ THERE ARE THREE PHASES to be considered when we talk about safety: (1) organization, (2) operations, and (3) human beings.

It is important that we should look carefully into our organization and see how each part fits into our safety program and into the general scheme of things.

We must, and I believe we do, realize that a good safety program without the full and sincere backing of top management is pretty sure to fail. Conversely, I am of the opinion that in the large majority of organizations where top management fails in safety, that this failure can be traced to the fact that the operating agencies have not kept them properly informed. With the multitude of duties in operating an industrial plant today, it is very easy to let some phase of the operations seem as though it is relatively unimportant. Each of you is probably familiar with some organization in which top management becomes vitally interested in safety only when a serious accident or a fatality occurs. In the case of lesser injuries, top management too often hears about them in a roundabout way, if at all.

I know of an executive vice president of a large company who, when he received recently a report from a service engineer of the corporation's insurance carrier, called together his production manager, his treasurer, and his insurance man. His opening statement to this small group clarified the remarks just made. To quote this executive, "I had thought we were doing all that was reasonable to prevent accidents but this report puts new light on the subject." This gentleman had not been fully informed and when he was given additional facts he was ready and willing to respond with the necessary action. It is just horse sense to keep your top management fully informed about safety.

Top management, however, is not the only important segment of management who must be concerned about safety. Personally, I feel that the supervisory group takes precedence in importance over high brass.

The responsibility for making our safety program work is placed in the hands of our supervisors. The authority and means for the prevention of accidents belongs to them.

Accident prevention is mostly personal

The prevention of accidents must be considered on a strictly personal basis. It requires that everyone work together to obtain the best results. Consider for a moment the evolution of a good football team. Here the players are first taught the general principles of football, and secondly, each individual player is taught exactly what he is to do and why it is important that he execute his functions as perfectly as possible. Similarly, the basic principles of accident prevention should be taught by the supervisor to his group of workers. This should be followed up by the supervisor through giving his individual workers personalized instruction as to safety on the particular job involved. Each of the workers should realize that upon him depends a great deal of the accomplishments of his fellow workers. You have all seen, at one time or another, a perfect play on the football team in which each of the offensive players carried out his assignment to the letter. When that happens it usually means a touchdown and I believe the application of this same spirit, determination and co-operation in the industrial plant is an important factor in the prevention of injuries.

It is important that each employee be talked to frequently regarding the prevention of accidents. To accomplish this it is necessary to place this responsibility in the hands of the departmental supervisor. Big meetings, general safety meetings, etc., are valuable, but *nothing can take the place of that personal touch between the foreman and his individual group of workers.*

By word and example the supervisor can maintain good, safe practices within

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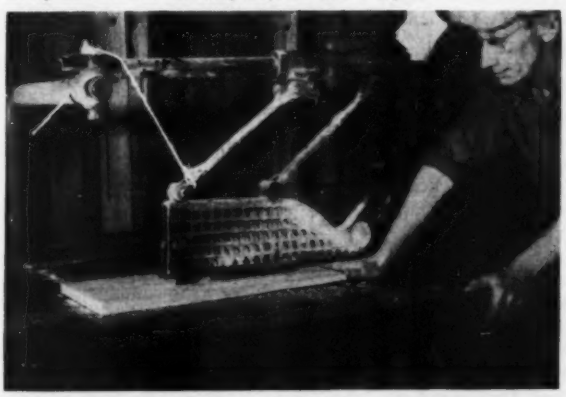
Mr. Thomson delivered this address before the Pulp and Paper Section at the 38th Annual Congress of the National Safety Council, held in Chicago, October 16-20, 1950. The illustrations that appear with this article are from slides used by Mr. Thomson; they have been furnished through the courtesy of The Champion Paper and Fibre Co.

LOOKING AT A PRETTY GIRL as she passed by might have been disastrous to this worker if the guard had not been in place as he worked near the nip

UNTAGGED SWITCH being thrown to operate position—millwright needs another tool and steps over rail just in time to escape trouble

JUST A SMALL JOB—he didn't think it necessary to use his safety belt. It was his lucky day; he didn't slip

A SOFT BED such as this—is not always ready and waiting. Employee fell 20 ft. into box of broke without a scratch



ASKING FOR A SEVERE HAND INJURY. Better play safe and leave the saw guard in its proper position

A FATALITY RESULTED when this car door hit an employee who stood in the exact spot where it fell

TAKING A SHORT CUT home, this employee slipped and kicked out the disconnect apparatus as the switch pulled out a cut of cars unexpectedly. A narrow escape!

HORSEPLAY CAN BE DANGEROUS. The unexpected happened when one worker stepped into the path of a piece of iron tossed for purpose of startling the checker

TESTING HIS LUCK by using this ladder. Is it worth the chance?

ACID SPLASHED ALL OVER—missed him this time, but he may have been badly burned

AN EYE INJURY struck just after he had removed his safety glasses

his department. The interest and enthusiasm of every supervisor to improve this phase of management is an important measure of his ability to handle men.

You are all thoroughly acquainted with, I am sure, the duties of the safety supervisor. His function is to make the safety program effective and to follow it up continuously and determinedly so that accidents and the resulting injuries to personnel in the organization may be eliminated.

His authority is that of an executive head of a staff section or department. He operates as a specialist, advising through the established channels to management and workers. He is the prime mover of the accident prevention effort and he reports in most cases through his staff superior to the higher line executives.

And certainly we can't overlook the workers themselves. All of them, from the oldest oldtimer to the newest new worker, from executive to apprentice, have the responsibility of complying with the policy that all work, regardless of its nature, be performed in a safe manner. I will have more to say on this most important point a little later.

The second phase which I want to talk about deals with operations. When your plant is down and not one single individual is within its boundaries, accidents and their elimination is not a problem—but note that I said *accidents,* not injuries.

When the plant is operating, however, accidents occur continuously and many of these accidents occur where there is no injury. I have often wondered about the actual number of accidents that occur where no one is injured. Perhaps some one in this room has made a study of this phase. If they have, I would be glad to hear something of the results at the conclusion of my remarks.

We often hear the statement "Damn lucky he wasn't killed!" Luck definitely enters into injuries and their severity. I would like to show you at this point some slides which point out the unfortunate importance of luck as it has to do with injuries.

Your supervisors and your safety departments have very little control over luck but they do have full control over accidents and their causes.

Again let me remind you that we are all prone to become interested in the safety program when a fatal accident occurs in our plant. That's a normal reaction because when this happens everyone is upset for several weeks. Many of us have had that sick feeling in the pit of our stomachs when we lose a friend and co-worker because of an accident. Many of us have wished we were a thousand miles away when we have had to tell a friend's wife that her husband wouldn't ever come home again. Things begin to happen. Everyone is up on their toes; suggestions pour in from all over the plant. New guards are made and installed and new rules are adopted concerning safe practices. I believe that it is just horse sense to use the same methods for all accidents and to be just as thorough in preventing accidents that cause no injuries, with the ultimate goal of eliminating injuries entirely.

At one time or another we have all probably talked about the old bugaboo of three serious accidents in a row. I don't think that's too hard to explain. An accident happens and most of the people in a department are upset. A second accident occurs and other departments begin to sit up and take notice. By the time the third accident comes workers, supervisors and top management are very impatient. Then we see action commencing all along the line, with the result that we have a period in which accidental injuries are nil. After a while, this cycle repeats itself. To my way of thinking it is just horse sense to be deeply concerned over any accident, where it is one, two, or three, rather than stress the number of serious injuries. Frankly, I do not believe in a lengthy list of "don'ts." A few fundamentally sound rules that are worthy of enforcement should make up the safety policies. If they are not worthy of enforcement, it is a better bet to omit them the next time your policies are published.

There are three simple rules a supervisor should follow to reduce accidents:

1) Give clear, concise instructions
2) Be sure the instructions are understood
3) Follow up frequently to determine if the instructions are being followed

We come now to the last, and in my opinion, the most important phase of safety, the human angle.

True story of one minor injury

In connection with injuries to human beings, it always burns me up to hear someone say, "It's only a minor injury—he wasn't hurt very bad."

In this connection I would like to tell you a story which I understand was an actual case:

It concerns a man whom we will call Jake, his wife, Sallie, and his daughter, who resided in a small town in North Carolina. This was a happy family. Their home was a small white cottage nestled in the mountains with white railing fence and flowers growing profusely all over the yard. Jake worked in a nearby sawmill, a happy and contented employee. Jake's one particular hobby was playing his guitar. He delighted in coming home to his clean and modest house, and in the evening after the usual chores, he would get out his guitar. Sallie would go to the old upright piano and their daughter, who had a delightful

voice, would sing. Many pleasant evenings were whiled away in this manner. They all anticipated, looked forward to, these evenings together.

To most of us this might seem rather drab; we could think of plenty of things to do which might have more zip, but to Jake that was their life; that's what they enjoyed.

One day in the mill, Jake caught his finger, his ring finger, in a conveyor. The accident resulted in his nipping off about a quarter of the first joint of his finger. Just a minor accident, didn't amount to much. No, it wasn't serious, he wasn't going to be maimed for life. They sewed up the tip and in due time nature healed up the end of his finger. Jake was soon back on the job and in the evening returned home as usual. After dinner one evening, he got out his beloved guitar, and lo and behold, he couldn't play. That little tip which he had lost was needed to properly finger the strings. Jake realized right then and there his guitar-playing days were over.

The ensuing evening came and passed and Jake could not readjust himself. He began to leave the house and go out for a walk. He couldn't seem to fit himself into the picture. Something was wrong; his guitar and those splendid evenings were gone, too.

It finally resulted in Jake becoming so despondent that he committed suicide. It broke up the family and the little cottage had lost its appeal. Yes, it was only a minor injury, one that didn't amount to much—yet it broke up a fine family, a home, and three lives. The minor injury may be a great deal more severe than we sitting up in the office may imagine. Let's not make light of so-termed *minor injuries*. It doesn't make "horse sense." Let's investigate these accidents with the same vim and energy as the more serious ones.

First person singular

I consider myself extremely fortunate in that I was able to learn first hand about the human angle.

I started in Champion at our Hamilton Division as a stevedore, unloading pulp, waste paper, etc., from the railroad cars. From there I went on to the beaters, paper machines, and on through the paper mill. Later on, I had the same experience in our pulp mill at North Carolina, starting in the woodyard and going on through the mill. I worked shift work and day work, in old clothes, with the regular operating gangs. I have seen a couple of my buddies get hurt and I've seen what a jolt these injuries were to their families. I think I understand their problems pretty well, and I found that all of them had their ideas and opinions and philosophies just the same as you who are here today have. As a matter of fact, I often think back to those early days and sometimes I even wish that I could get back on the unloading gang where the work was done after eight hours and the only responsibility was to put the pulp in the right place.

I didn't know particularly much about safety in those days and, as I recall, we didn't worry too much about accident prevention. Of course we looked out for ourselves and those we were working with, and we followed the safety rules in a fairly decent manner. I can remember, though, that it always used to sort of gripe us when the safety man came around and had his say. Looking back on it, I guess we thought that though something might happen to the other guy, each of us felt he was smart enough and strong enough to stay out of trouble. I do remember, though, that I let Kenny Faist, whom a lot of you know, talk me into buying a pair of safety shoes, probably just to get him off my neck. It so happened, however, that a couple of days later a hand truck with an 1800-lb. bale of waste paper passed over one of my feet. As you can guess, the safety shoes saved me a lot of grief, and my attitude about safety and the safety supervisor changed abruptly.

Another incident that sticks in my mind came a little later when I was working on the board machine. I was threading the sheet through the calendar stack with my hand open when the boss machine tender jerked me down off the platform and read me off in fine style, and showed me how to do the job properly, with my fist. That short talk added some fancy words to my vocabulary, but I appreciated the fact that I deserved it. That particular foreman was doing a real job in safety.

Some people say that the best drivers on our highways today are those who assume the attitude that every driver but them is crazy. This theory results in their taking that little extra precaution that is so necessary to avoid auto accidents. This theory may well apply to industrial plants as well as the highways.

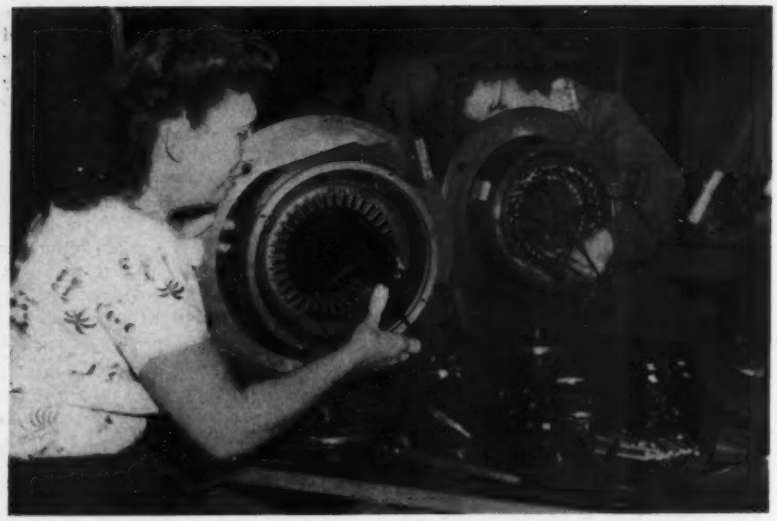
A number of years ago, Champion decided to do some research work as to the advisability of adopting an individual incentive plan. Immediately a cry went up from the safety department that could be heard for blocks. The safety group mumbled among themselves that "there goes the safety record" and that our medical department wouldn't be big enough to take care of the workers who would be injured trying to produce enough to make some bonus.

Although I was not in Industrial Relations at the time, I had my doubts, too. The scramble for production, employees' taking short cuts to add to their bonus, etc., seemed to paint a bad picture from the safety standpoint. What happened, however, was another eye-opener. After many plans were carefully studied and the final decisions made, an incentive plan was installed that was approved by practically all of the employees. The plan suggested ways and means of operating equipment sensibly and efficiently. Damaged equipment meant delays as did damaged materials, and both resulted in a loss to the company as well as to the individual workers. But the most surprising thing to me, of course, was that accidents did not increase. In fact, they decreased as the employees worked under the new plan and, of course, injuries decreased also.

In industry we are dealing with men and women and we must accept them as individuals who can think and reason, and not as automatons which are controlled by buttons on the superintendent's desk. It is human nature for each individual to feel that the accident is not going to happen to him. It is also human nature for an individual to want to help and protect other human beings and the security of his job. Most workers are impressed when they understand that they are operating expensive equipment and handling costly materials and they are willing to operate safely since it is to their benefit financially to minimize delays and damaged goods; and the great majority of them can understand the fact that their failure or negligence may result in an accident and an injury to their fellow workers.

I imagine that every one of us here today has at one time or another been out in the mill and seen some big, husky guy do something in a way that could cause him an injury. Perhaps we felt that he was lucky and got away with it or that his supervisor will catch him and straighten him out; or perhaps we just felt too embarrassed to caution him that he might get hurt the way he was doing his job. We are all familiar with the laws of chance that may let us get away with such practices a number of times before the injury occurs. But wouldn't it be better to approach this man on the basis that his working safely may well save material or protect equipment, or show him that what he is doing may result in an injury to somebody else. In most cases he will appreciate those angles.

At Champion we have had excellent results through the use of our Accident Review Boards. The Board meets as soon as possible after a lost-time injury to determine the cause of that injury and to make recommendations to management to prevent recurrence. Our workers are enthusiastic about this work and we feel that it is in a small part because they may save themselves an injury, but in the main, it is because it gives them an opportunity to help their fellow workers avoid an accident.



New insulating materials and techniques employed by Reliance provide . . .

Lower maintenance and increased service life for electric motors

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▶▶▶ RECENT DEVELOPMENTS in electric motor design and construction have been directed principally toward enabling motor users to secure appreciably longer life of motors, with less maintenance and less "time out" for major repairs and overhauls.

Improvements in motor insulation, in particular, may be cited as major contributors to easier inspection and servicing, less downtime and machine outage, and lower maintenance costs. Specifically, they have been designed to combat more effectively than generally possible heretofore those operating conditions which affect motor service life most severely—corrosive atmospheres, total winding temperatures, dust and dirt, oil, and vibration.

Among such newer developments of top importance from the maintenance viewpoint, are more effective materials and improved coating methods, especially for insulation of motors (Class B) designed for high-temperature service.

Fiberglas tubing

Out of an extensive study of varnished tubing, for example, grew a comprehensive quality-check-and-improvement testing program, covering various types of available tubing suitable for coil leads in both semienclosed and open-slot design motors. Directly from this, in turn, stemmed a new Fiberglas tubing—"BH 649" Fiberglas tubing—developed by Bentley, Harris Mfg. Co., Conshohocken, Pa.

It was found that varnish-impregnated tubings, although high in initial dielectric strength, subsequently failed because of varnish film separation when held in a bent position over long periods of time. With a plastic-coated B-H sleeving, this difficulty was overcome and more effective insulation secured by the disposition of the inside cushion of fibers to accept a subsequent coat of impregnating varnish.

Initially the film of this tubing showed a tendency to flow under severe conditions of pressure and heat. This was ironed out satisfactorily through further research and test work, conducted jointly by Reliance and Bentley, Harris, which culminated in the development of "BH 649" Fiberglas Tubing. This is now used in place of canvas-reinforced phenolic material in all Reliance standard precision-built motors.

Another new material which, as punishing performance tests in the laboratory indicate, also contributes to increased insulating efficiency and appreciably longer motorlife, is "Glastic." This is a Fiberglas reinforced polyester laminated developed by Laminated Plastics, Inc., of Cleveland, after years of experimental research. This material is now being used in selected motor components, including such items as middle sticks, slot wedges, armature and laminations, collars, and coil washers.

Glastic

Replacing cloth-based or canvas-reinforced phenolic laminates and asbestos-filled materials commonly used for these purposes, this low-pressure, fast-curing plastic laminate has, by comparison, already clearly demonstrated its superior qualities. Among them are: high heat resistance, arc resistance, impact strength, flexural strength, and low water absorption—characteristics which prove especially important to efficient operation of motors under the high humidity conditions encountered in some industrial applications.

Use of "Glastic" in electric motor manufacture is currently being extended in another direction, too. That is in the molding of *solid* shapes—brush studs, end shelves, and coil supports. For these parts, a special formulation is used. Compounded from selected polyester resins and Fiberglas, it is different from the standard "Glastic" sheet material used for the various components previously mentioned in that it can be successfully compression-molded into intricate shapes of variable cross section.

Applications such as the foregoing aptly exemplify the increasingly important role that new and improved materials are coming to play in the insulation of motors installed for operation under such adverse conditions as the high ambient temperatures of a steel mill, the corrosive fumes of a chemical processing plant, or the high humidity of a paper mill.

Still other important applications of new insulating materials are to be found in the bonded slot liners of laminated "glass-mica-glass" used in phase-to-phase insulation of motor coils, in the glass-sleeved head connections of modern motor construction, and in the adoption of Fiberglas tape to tie down stub connections to coil heads.

Exposure of motors to extreme moisture, acids, alkalies, oil, dirt and abrasive dust likewise places a premium on the protective values provided by the materials used for insulation. On this score, too, recent strides in methods as well as materials mark a substantial step toward reduced maintenance. A special "Reli-X" insulation treatment adopted by Reliance as standard production procedure is representative of the progress being made in this direction.

Varnish motor windings

Varnish-coating of motor windings has a four-fold purpose: (1) to penetrate windings; (2) to drive out air and fill in voids; (3) to build up a hard, tough protective film on exterior surfaces

of windings, and (4) to bond the wires firmly to each other and to the metal parts with which these wires come in contact.

Accomplishment of these broad objectives provides a number of definite benefits. It increases dielectric strength of windings against grounds, and against shorts to other parts of the windings themselves. It increases resistance of coils to moisture; and it improves the transfer coefficient of the windings. Bonding of wires to each other and to the frame work of armatures, rotor or stator helps hold the coils of which they are part against movement caused by expansion and contraction by magnetic forces in the motor, or (in the case of rotating parts) by centrifugal forces.

All electrical maintenance men know the *ideal* varnish treatment would do all this; but they also know that in practice, it is not actually possible. The Reliance method, however, may be regarded as significant in that it represents a decided advance in this direction. Of present-day coating techniques applied in standard motor-insulation practice, it comes the closest to approaching the results desired.

Varnishing techniques

In this process, wound rotors, stators or armatures are first preheated to drive out all moisture, then immediately dipped in a new synthetic polymerizing varnish of viscosity and specific gravity which will give thorough penetration. All voids are filled with this thermosetting plastic impregnating material, resulting in a solid mass of wire and insulation.

Next, windings are baked under controlled temperature to drive out all volatile content, then immediately immersed in the same synthetic polymerizing varnish (but of higher viscosity) to give maximum fill and "build-up." A second, thorough baking follows to produce a tough, hard, glossy protective covering. Spray application of an oil-resisting, air-drying, orange-colored enamel provides the final protective finish coat.

Uniformity important

Uniformity of results in the Reli-X varnish treatment is secured chiefly through close control of four operating variables: (1) viscosity, (2) specific gravity of the varnish used, (3) oven temperature, and (4) processing time.

Accumulating plant experience plainly shows that in addition to contributing to greater operating efficiency and longer life of electric motors, these newer, improved insulating materials and methods provide a number of worthwhile advantages conducive to good maintenance practice and economy. "Glastic" slot sticks and "BH 649" Fiberglas Tubing or sleeving on leads resist breakage from vibration to a far greater extent than other materials previously used, thereby reducing equipment shutdowns and limiting necessary maintenance expense to a minimum on this score.

Again, it has been found that vibration due to misalignment or other causes is less likely to damage windings which are more firmly bonded together, as provided by the improved insulation treatments typified by "Reli-X." Costly shorting between coils is thus reduced.

Impregnation of wound rotors, stators or armatures with the new synthetic polymerizing varnish used by Reliance also produces a smooth, hard surface highly resistant to acids, alkalies, other corrosive fumes. Additional dipping operations assure improved varnish "build-up" and body. Windings can be cleaned easily as no crevices exist for collecting concentrations of dust and dirt.

Spray windings

Spraying of windings with a special orange-colored, air-drying, oil-resisting enamel as the final protective finish coating is proving particularly helpful to motor users in expediting periodic maintenance inspection, cleaning and routine servicing. Against the orange color, dirt and other foreign material show up plainly. Since the material dries to a hard, smooth finish, removal of accumulated oil and deposits can be easily accomplished *before* dust and dirt have the opportunity to combine with atmospheric moisture to form gummy sludge on windings, and in the ventilating passage of motors.

Improved bearings

Motor bearing construction similarly reflects the benefit of postwar developments. For instance, Reliance precision-built motors now use double-shielded ball bearings in a mounting with pressure relief along the shaft to the exterior of the motor guards, thereby protecting against damaged electrical parts which otherwise could be caused by grease leaking into windings, brushes, and commutators.

Utilization of factory-lubricated double-shielded bearings thus may be said to introduce a new motor-maintenance concept of inherently far-reaching effect and importance, as this practice now makes it impossible to overgrease or undergrease motors incorporating this construction refinement. The specially-developed method used for precision mounting of bearings affords maximum protection to windings and interior of motor, and maximum protection to bearings against dirt, moisture, and excess or insufficient lubricant. Bearing housing provides a large reservoir of grease, automatically replenishing lubricant inside the bearing as needed over long periods of operation.

Should such motors be subjected to unusually severe operating conditions, additional grease may be added without danger of overgreasing. A clearance for the escape of excess grease is provided along the shaft and cap. The double-shielded bearing and rotating labyrinth further protect grease from reaching motor windings and interior. Thanks to these improvements in motor design and construction, maintenance to provide maximum trouble-free operation can be accomplished with minimum scheduled inspection.

Less maintenance required

Frequency of inspection and cleaning is a maintenance variable that depends upon and is determined by individual plant conditions and practice. However, based upon the experience of plants which follow a well-planned program of periodic inspection and maintenance attention to meet their own particular specific needs, it is becoming increasingly apparent that with the more complete insulation of winding as now provided, coupled with the absence of oil on windings, today's motors need less frequent inspection than previously. And when they are inspected, they require less time for cleaning than presently involved with older types.

Of equal importance, too, is the fact that flushing out bearings now can be eliminated as standard maintenance practice, as it is neither recommended nor required for motors incorporating double-shelded bearings. Lastly, less cleaning solvent can be used to remove accumulated dirt from windings due to colored surfaces on which dirt is more readily exposed, and also to the smooth, hard, tough surfaces to which dirt adheres less tenaciously. If cleaning is done often enough, air-blowing can be used.

Summary

To summarize, motors today called upon to meet high-temperature service conditions require insulation with a much greater margin of safety than was available even a relatively few short years ago. Performance reports from factory and mill managements and maintenance departments indicate that new insulating materials and methods of the types outlined give motors the highest degree of protection yet realized against foreign materials, excessive temperature rise and similar operating abuses.

This added protection means that motors can now be treated to remain on the job longer, with less maintenance and fewer "times out" for repairs. These newer insulating materials, moreover, because they permit more effective use of active materials (copper, aluminum and steel) on a per-pound basis, contribute to better performance of motors in all ratings.

Interconversion of Williams Freeness Values

D. S. DAVIS
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▶▶▶ ALTHOUGH THE SEVERAL types of freeness tester in current use in the paper industry do not measure exactly the same aspects of this interesting and important property of wetted fibers, there is evident need for inter-conversion between the various scales. The first extensive study (*3*) of this problem embraced seven testers operated on sulphite stock only. The second (*1*) covered only the Williams Model B and Precision freeness testers when used with repulped chip, toweling, tissue, newsprint, mimeograph, kraft, rag, book and blotting papers as well as with several pure pulps. The most recent investigation (*2*) included more repulped paper of foreign origin and was designed to check the results of the second.

Experimental

Twenty-five grams of each paper product were repulped with 2500 ml. of water by means of a soda mixer. Stock suspensions of approximately 333 and 400 ml. were withdrawn to supply 3 and 4 grams of oven-dry samples for the Precision and Model B testers for determinations made in triplicate at 25C. and 20C., respectively. At the end of each test the actual sample weight was determined and all freeness values were corrected to the recognized standard sample weights of 3 and 4 grams.

Discussion of results

Moore's data (2) are plotted in Figure 1 upon which appears, for purposes of comparison, curves without points that represent the results of the previous investigations. For the most part Moore's work shows higher values of Precision freeness than do the earlier studies although there is close agreement with the findings of Cousins and Davis between Model B values of 475 to 750. Moore's data and those of Simerl and Davis agree well only above Model B values of 700.

The equations of the three curves of Figure 1 and the average percentage deviations of individual Precision values from those calculated from the equations are presented in Table I in which P is the Precision freeness in seconds at 3 grams and 25 C. and F is the Model B freeness in milliliters at 4 grams and 20 C.

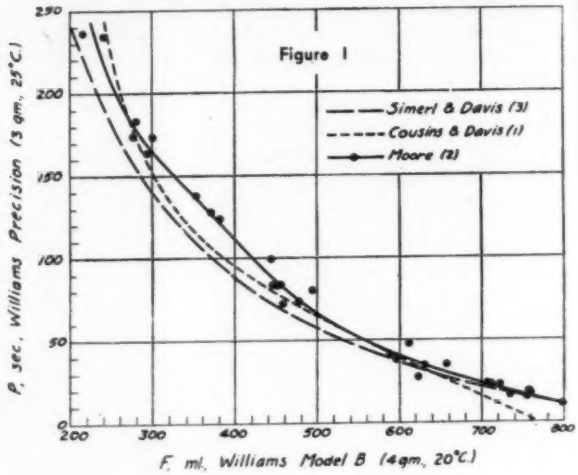
Table 1—Equations and percentage deviations

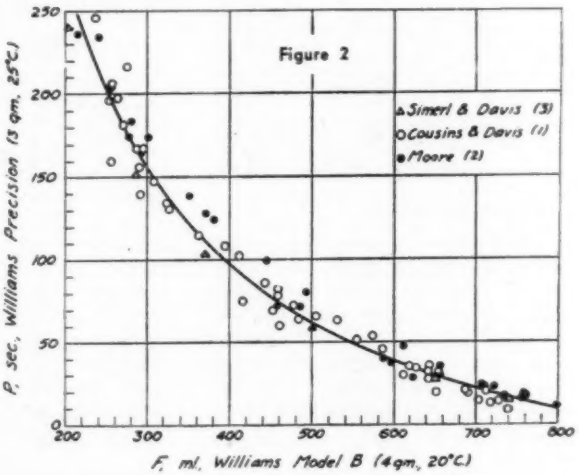
Investigators	Stock	Equation	Percentage Deviation
Simeral and Davis	Sulphite	$P = \frac{62{,}700}{F} - 68.5$	2.5
Cousins and Davis	Repulped paper	$P = 183.5 - 0.2386\,F. + 103.984 - 0.00791\,F.$	9.6
Moore	Repulped paper	$P = \frac{72{,}230}{F} - 79.8 + \frac{28}{.0.042(130-P) + .0.042(P-130)}$	6.6

A Correction

IN CONNECTION WITH the nomograph that accompanied "Loss in Head on Pumping Fibrous Suspensions," which was published in the February, 1950, issue of THE PAPER INDUSTRY (p.1316), the following discrepancy appeared:

Values of ΔH read from the chart should be multiplied by 12. Thanks are due J. P. Hyman, of Australian Paper Manufacturers, Ltd., South Melbourne, Australia, for pointing out the error. —*by D. S. Davis*, author





The data from all three investigations are plotted in Figure 2 along with the composite curve recommended for interconversion. Values of the Precision freeness read from the curve, which has the equation

$$P = \frac{70{,}750}{F} - 79.6$$

show the following agreement with the original data:

Investigators	*Stock*	*Percentage Deviations*
Simerl and Davis	Sulphite	8
Cousins and Davis	Repulped paper	16
Moore	repulped paper	10
All	Sulphite and Repulped paper	13

Vagaries in *p*H and content of filler probably account for some of the high percentage deviations of calculated from observed values.

Literature cited

(1) Cousins, C. R., and Davis, D. S., *Paper Ind. and Paper World*, 21, 160 (1939).

(2) Moore, A. S., Jr., B. S. Thesis in Chemical Engineering, "The interconversion of freeness values as measured by means of the Williams Precision and Model B Testers," Virginia Polytechnic Institute, 1950.

(3) Simerl, L. E., and Davis, D. S. *Paper Tr. J.*, 91, 58 (1930).

Paper and paperboard making—XIII

HARRY WILLIAMSON

Cylinder Machine . . . The overflow type vat-3

FOR ALL PRACTICAL operating purposes in any type of reasonably well designed vat and circle we need only consider the hydraulic drop occasioned by the opposing liquid column in the back circle as it rises or falls and the effect of such rise or fall on the initial velocity imparted to the flowing mixed volume in the formation circle.

High head

The differential in levels between the entrance to the formation circle marked 45 deg. and the back circle marked 40 deg. of the mold circumference, respectively, is only two inches on a vertical line. The effective velocity from a two-inch head height (referring to Table 1) is only 3.27 fps or 196 fpm. In this instance, at the point where FORMATION COMMENCES we have a flow speed of mixed volume of 3.27 fps *less* all diminishing of flow speed from all other frictional or diverting sources. We have an initial velocity force of 3.27 fps to *deliver to the farthest point in the formation circle* the demand volume at commencement of formation. On arrival at this point that which is left of this initial flow speed is *instantly* transposed from a vertical flow to a flow *through the wire mesh* along the arc of *clean* wire surface submerging by rotation in the mixed volume. At the commencement of formation the flow of water through the wire mesh is *unopposed* by the liquid level inside the mold because the SUCTION HEAD is carried lower than this point. In addition to the effective pressure of the suction head, which we know to be 0.036 lb. per in. of suction head height, or as shown in the Figure, 13 inches of suction head, the residual of the initial velocity of 3.27 fps *increases* the flow of water through the wire mesh and, therefore, increases the initial rate of formation.

As we know that free stock (stock which parts with water freely) is the *fastest forming rate* and the result is *uneven* formation and as we know that control of the time rate of formation is the objective of all stock control in the beating room, then we realize that variation of time rate of COMMENCEMENT OF FORMATION, which is the foundation of the total sheet to be formed, is also important. Now suppose we examine the velocity of liquid volume flow around the circle occasioned by the low head on the five foot diameter mold shown in Figure 1.

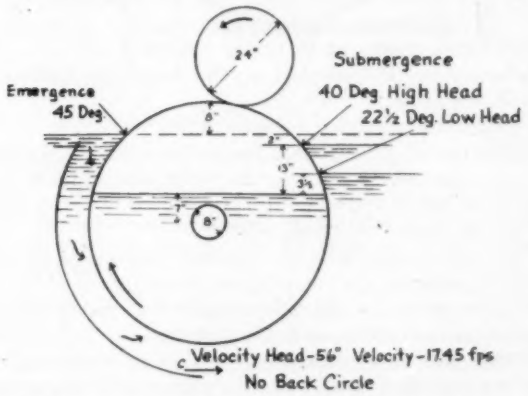


Fig. 1—5 ft. diam. counterflow type. Scale 1/20 in.—1 inch

Low head

Using the example of *low head* shown in Figure 1, we find the difference in liquid level between the point marked 45 deg., the entrance to the formation circle, and the commencement point of formation in the BACK CIRCLE marked 22.5 deg. is nine and one-half inches as compared with only two inches velocity head when operating with a *high head.* Again referring to Table 1, we find that nine and one-half inches head height will impart a velocity flow speed to the liquid volume of 6.95 fps or 417 fpm. We also note the effective suction head, the difference between the inside and outside liquid levels has dropped from 13 inches to only three and one-half inches by this lowering of level in the BACK CIRCLE. The net result of this velocity head change by dropping the level in the back circle is two fold:

(1) The velocity of flow through the formation circle to the point of COMMENCEMENT of formation is *increased* from 196 fpm to 417 fpm, or a ratio increase of nearly 2.13 to one.

(2) The effective SUCTION HEAD, or differential of liquid level between the inside and outside of the revolving cylinder mold, is *reduced* from 13 inches to only three and one half inches, a drop in effective pressure per square inch, formation pressure, of 3.7 to one.

By having greater UNEXPENDED velocity force which, transposed from the vertical flow direction to formation flow direction by the *instantaneous* rush of water *through* the clean wire mesh means a FASTER INITIAL RATE OF FORMATION and *less* effective SUC-

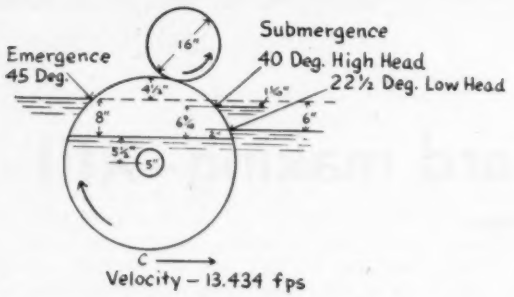


Fig. 2—3 ft. diam. counterflow type. Scale 1/20 in.—1 inch

TION HEAD PRESSURE to *firmly* hold this initial rapid formation to the surface of the revolving cylinder mold, we have:

(1) Initial *lumpy* formation, and

(2) Initial *loosely held* formation which will tend to slip and slide throughout the remainder of the revolution of the cylinder mold.

It can, therefore, be stated that:

(1) HIGH HEAD with *low* velocity flow speed means MORE UNIFORM and TIGHTER FORMATION, and

(2) LOW HEAD with *high* velocity flow speed means *more uneven* and more *bulky formation.*

The detailed explanation of the *effect* on formation of velocity flow speed change pertains to the operation of *both* the counterflow type of vat and the overflow type. The major difference between these designs is that the overflow vat is equipped with a slice, a mechanical adjustment whereby the velocity head can be *regulated* at completion of formation, and also that INITIAL formation takes place at the point of INITIAL VELOCITY.

The velocity head of the counterflow vat is regulated primarily by control of the freeness of the stock, the time rate of water drainage which properly controlled will keep the velocity head *constant,* or by the addition or shutting off of water supplied by the head box to the vat. In *all* paper or paperboard operation the primary control of velocity flow speed is *in* the stock preparation.

As the stock becomes more free, the water drainage rate is faster, the demand at initial formation point is greater and, as this point is in the back circle in the counterflow type vat, the differential in liquid level increases and the velocity flow also increases.

Slow draining stock *less* velocity in the formation circle.

Free draining stock *more* velocity in the formation circle.

However, we can still bring the *velocity* of the free draining stock to the *same* velocity of the slow draining stock. All we have to do is add water to bring the liquid level *back* to the high head differential.

The liquid level in the back circle of the counterflow vat *will* go *down* as the stock becomes *free* and the *velocity* of the mixed volume will be proportionately *faster.* As the stock becomes SLOW, the liquid level in the back circle WILL RISE and the *velocity* of the mixed volume in the formation area, the TOTAL CIRCLE, will be *slower.*

In the operation of *any* type combination cylinder mold vat the PRIMARY CONTROL, to *prevent* variation of total volume of formation water used and velocity of mixed volume in the formation circle, is by controlling the freeness of the stock in the various phases of stock preparation *before* delivery to the paper machine.

The SECONDARY CONTROL is, in the operation of the overflow type, adjustment of the slice arrangement which permits a raising or lowering of the HYDRAULIC DROPHEAD, the column of liquid *opposing* the initial liquid column. In the operation of the counterflow vat, the SECONDARY CONTROL is by putting on or shutting off water either at the screen or vat supply mixing box. This action controls velocity by adjustment of TOTAL VOLUME.

By such means the velocity flow speed of the mixed volume, from which the sheet is being formed, *can* be *controlled* in its passage *through* the formation area. *Even* velocity rate flow will result in even formation of the quality of formation consistent with value of the stock and the preparation of the stock. Whether the formation is bulky or tight there will be no change if the velocity flow speed remains the same. From this we can get a simple operating rule. Assuming the same stock and we want to make the formation tighter, raise the head in the circle and slow down the flow velocity and the formation will be *tighter.* Conversely, to obtain more bulk, *lower* the head in the circle and increase the flow velocity and the formed sheet will have more bulk. Alternatively, we can *lower* the suction level *inside* the mold and obtain more inches of suction head differential and, therefore, more pressure per square inch to hold the forming sheet against the surface of the revolving mold to get a tighter formation or reduce the effective pressure by *raising* the suction level and get a more BULKY formation. This is accomplished by permitting more or less water to spill over the adjustable dams.

CONTROL OF VELOCITY FLOW SPEED IN THE FORMATION AREA IS IMPORTANT.

Figure No. 2

Cylinder mold diameter 36 inches; couch roll set off center 6 inches; counter flow type operation. High and low VELOCITY head. Circumference of cylinder mold equals 3.1416 x 3 ft. equals 9.4248 feet.

	High head	Low head
Total degrees formation	265.0	247.5
Total length per revolution for formation	6.9377 ft.	6.46646 ft.
Formation length expressed as per cent circumference	73.612 per cent	68.61 per cent

Using exactly the same number of degrees for formation purposes as used in Figure 1 showing the 60 inch diameter cylinder mold, Figure 2 showing a 36 inch diameter mold offers a direct visual comparison of all velocity and suction head differentials. Again assuming for the moment the elimination of the back circle, the velocity head would be the distance from point marked 45 degrees to point C at the bottom vertical center of the cylinder mold. This is 2.8 feet

of head and will impart to the liquid volume a velocity of 13.434 fps or 806 fpm. Using a *high* head, building the liquid column in the back circle to the point where formation commences (in this instance 40 degrees of the mold circumference) we then have a differential in liquid level height *outside* the mold of 1.1 inches or a velocity of 2.431 fps. The SUCTION HEAD at this point, we note, is nearly seven inches.

Using the example of the LOW HEAD, we find a difference in liquid levels between the point marked 45 degrees and the commencement of formation, this time at the point marked 22.5 degrees of six inches or a velocity flow of 5.67 fps. With this low outside level in the back circle the suction head has dropped from 6.9 inches to only two inches.

The ratio difference between velocity head height of SLOW stock and FREE stock is nearly 5.46 to one and the ratio difference in suction head heights is 3.45 to one.

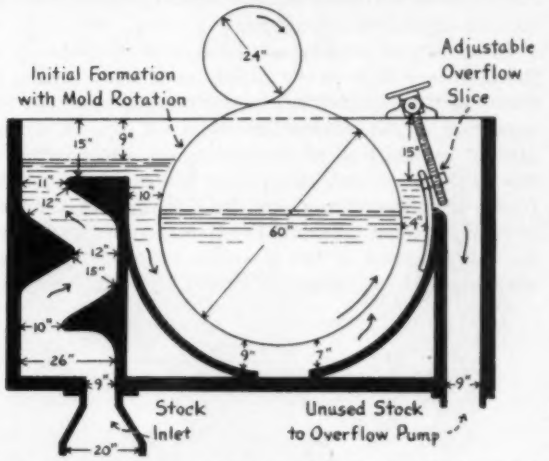


Fig. 3—General arrangement "overflow" vat. Scale 1/20 in.—1 inch

Figure 3

This arrangement of the overflow type vat and cylinder mold combination is primarily designed to facilitate control of velocity and *direction* of the flow of the liquid volume from which the paper is formed in relation to the direction of rotation or travel of the formation unit.

By this arrangement cylinder mold formation differs from the counterflow type vat in the following three distinctive functions of application:

(1) The flow of the mixed volume in the formation area is in the *same direction* as the rotation of the cylinder mold.

(2) COMMENCEMENT of formation takes place before the mixed volume *enters* the *circle* and is, therefore, under the influence—if any—of the APPROACH flow velocity.

(3) MECHANICAL CONTROL of velocity flow *passing through the circle*, REGARDLESS of stock FREENESS, may be effected by use of the adjustable slice placed at the OUTLET of the circle.

A fourth application of formational function is that more liquid volume per revolution of mold may be passed through the circle than the demand requirements of the cylinder mold per revolution. This fourth item is probably a necessity to prevent thickening in the case of free stock, rather than a necessary factor of original design.

This change of design represents the most *radical change* in the formation of paper by the revolving cylinder mold method since the first use of the counterflow type vat. It is a definite approach to duplicate, as nearly as possible, the hydraulic conditions of the very much faster fourdrinier operations pertaining to velocity of liquid volume from which the paper is formed. Moreover, recognizing that velocity flow force of liquid volume in fourdrinier operation is intercepted, diverted and definitely NEGATED as such in *less* than one third of formation time per revolution of forming wire mesh, the inclusion of the operating slice in this design is for the purpose of regulation and to ELIMINATE, if necessary, the factor of *velocity* in the *formation* area caused by a differential of head height between the INLET and OUTLET of the formation circle.

When the lip of the overflow slice is level with the liquid level at the INLET to the circle, the PRESSURE of the liquid column in the back circle is equal to the pressure of the liquid column in the FRONT circle; pressure being equal, there is no velocity flow force *through* the formation area other than the REPLACEMENT flow of USED liquid volume.

The immediate source of supply to the VAT-CIRCLE-CYLINDER-MOLD combination, the actual cylinder machine, is the mixing box. To avoid confusion this author has deliberately refrained from specific mention of the VELOCITY flow force imparted to the liquid volume by the differential between liquid levels in the mixing box and at the INLET to the formation circle. The function of this flow force is to MAINTAIN a constant supply of fibers EVENLY DISPERSED, with no flocculation of individual fibers into bundles, in the carrying medium water to the formation area. We have noted the use of baffle boards, perforated rolls, successively expanded and restricted compartments and velocity throats through which the mixed volume flows in APPROACH to the formation circle and finally the making board and wings at the actual entrance to the formation circle as final adjustment of volume distribution.

Theoretically, the ideal APPROACH flow condition would be that of the mixed volume delivered in constant required supply to the INLET of the formation circle at ZERO velocity and the *replacement* of volume used in formation per revolution of the cylinder mold *from* this supply pool at the making board to be governed *only* by the drainage of water through the wire mesh in the act of formation. Under these circumstances formation would be entirely governed by TIME RATE OF FORMATION and velocity of flow in the formation area and to the formation area would be constant. Because of the varied requirements in ream weight and specification values of the variety of paper boards to be made on the same paper machine, a

FIXED condition of APPROACH equally suitable to all conditions of flow is impossible.

Flexibility of manual adjustment of the velocity of the approach flow to the supply pool is by raising or lowering the liquid level in the mixing box. In the operation of the counterflow type vat this is accomplished by shutting off or putting on water either at the screen preceding the mixing box or at the vat entrance *from* the mixing box. In this manner, VOLUME is changed to INFLUENCE APPROACH FLOW VELOCITY. In the operation of the overflow type vat, equipped with a slice control at the OUTLET of the formation circle, velocity or APPROACH flow can be increased or decreased for finer control by raising or lowering the slice and thus increasing or decreasing the amount of overflow, *without* changing the total volume in use.

As the volume of water per individual vat in modern cylinder machine operation is in *thousands* of gallons per minute, and even dispersion of the fibers *must* be accomplished and maintained until formation of the fibers into a sheet of paper is completed, the problem of controlling any one of the THREE VELOCITIES of liquid volume flow without interfering adversely with either of the other two is apparent.

Peeler being given test by Research Center at Gorham, N.H.

Pulpwood peeler will operate in all seasons

▶▶▶ A PORTABLE PEELER unit used successfully for several years peeling mine props and pulpwood in the Hearst, Ontario, section of Canada is now manufactured by the Sandy Hill Iron and Brass Works, Hudson Falls, N.Y.

The Peppy Peeler, as it is called, works this way: As a log passes through the machine, it is held firmly against free wheeling guide plates for regulating the depth of the cut. The log rotates and moves forward at the same time. A knot cutter removes the tops of the knots before they reach the peeling knives. The machine is equipped with speed changes for both feed and rotating speed of the log, and it is also possible to reverse the direction of rotation.

The capacity of this machine will vary from two cords upward per hour, depending upon the type of wood and season. Spruce, balsam, poplar and jackpine have been very successfully handled. There is every indication that it will also peel the various hardwoods. It goes without saying that straight wood feeds much faster and cleans more completely than crooked wood. Wood in 4-ft., 8-ft. and 12-ft. lengths runs through the machine at nearly the same speed. The peeler will handle wood 3 inches in diameter up to 20 inches in diameter.

The machine has been used for peeling green wood at all seasons of the year, dry wood, pond soaked wood, and frozen wood; in fact, it will peel the year around. It makes possible a clean stick of pulpwood at a minimum loss.

A team of three men is used for operating — one feeding the machine, one operating the machine and a third to clean deep wens or holes in the wood, black knots or any minor spots skipped.

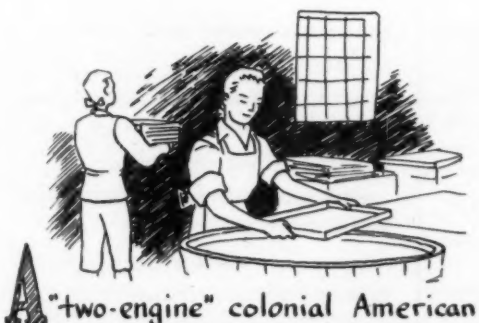
Various tests are being made to determine bark and fiber losses. From information obtained to date, the total loss apparently can be held below 20 per cent for bark and solid wood. Solid wood loss is less than 10 per cent depending on the requirement of the mill as to cleanliness. This includes removing the knots and results in a much higher fiber yield per cord of peeled wood.

This portable peeler weighs approximately 1800 pounds without the engine. It is suitable for mounting on skids, for operation on its own base, mounting on low slung truck wheels or for stationary mounting. Several of these peelers are in operation in Canada mounted on jeeps and TD-6 tractors and are being driven with the take-off of the engine.

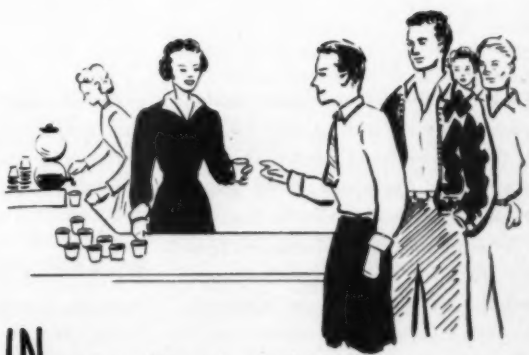
PAPER SKETCHES

A MILL at Culhuacan, Mexico, was making paper 115 years before Rittenhouse started his enterprise in Pennsylvania (in 1690).

The typical beater used in papermills of the late 1700's and early 1800's had 60 teeth, 20 to 24 cutters in the block — and made 180,000 cuts per minute. The high humming noise it produced as it revolved was so loud that it could be heard at a considerable distance from the mill.

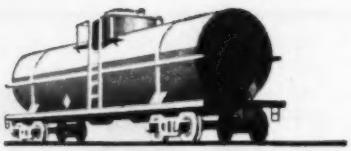


A "two-engine" colonial American vat mill of the mid-18th century produced not more than 250 pounds of paper in a 15-hour day.



IN case disaster strikes, the paper industry has set aside 25,000,000 paper cups and containers for the use of civilian defense authorities.

soda bleach savings with Wyandotte liquid caustic soda



1 Handling costs are reduced because less labor is required in unloading, storing and using *liquid* caustic.

2 Soda bleach foams less in the washers than other bleaching chemicals. Pulp draining and drying are faster, more economical.

3 Soda bleach made with Wyandotte Caustic Soda insures a cleaner finished paper with a minimum reversion of brightness.

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NEW DIRECTOR OF NPA'S pulp, paper and board division is Gabriel J. Ticoulat, now on leave from his post as vice pres. of Crown-Zellerbach Corp., San Francisco

CELEBRATED ANALYST Henry J. Taylor was featured speaker at the APPA banquet at the Waldorf-Astoria Hotel on February 22. He spoke on "The Korean Situation"

APPOINTED BY NPA as advisor on paper and board converted products committee is Wm. F. Erisman, pres. and gen. mgr. of Erving Paper Mills, Erving, Mass.

Paper industry problems headline annual meetings

Domestic pulp in adequate supply, but European pulp production expected to go down. Chemical supply barometer slightly below normal. Price fixing and export controls draw much discussion. NPA calls several key men from the paper industry to act as consultants.

▶▶▶ WILL THERE BE AN adequate supply of pulp in 1951 sufficient to enable the paper mills to continue operations at their present high rate of output?

That was the $64 question which a thousand leading executives of the paper and pulp industry tried to answer at the annual convention of the American Paper and Pulp Association and its divisional groups which opened at the Waldorf Astoria, New York, on February 19.

This was the principal topic at all of the many meetings during the week, with problems of meeting Government requirements under the industrial mobilization program a close second in importance.

Out of the welter of differing opinions it seems to be fairly well established that salient conditions during 1951 will include the following:

1. There will be sufficient pulp to provide the necessary volume of paper and paperboard unless unexpected world developments bring about a radical change in present outlook.

2. While there will be pulp sufficient to meet industry needs, the price plateau will be materially higher than in 1950, and this means a somewhat higher price for paper of all grades.

Throughout the week, Government representatives, pulp consumers and pulp manufacturers expressed a variety of opinions as to the future, but on many facets of the problem the forecasts seemed to agree.

Summarizing the addresses made by various industry leaders it seemed to be the general opinion that the United States and Canada will have a materially larger tonnage of pulp available than was the case when World War II broke, even though much of the new capacity may be needed for nitration for explosives. During World War II, Scandinavian pulp was out of the market owing to oceanic blockades. This is not likely to be the case in 1951, for large quantities of pulp will be coming across the ocean, even if not in tonnage equivalent to 1950.

An immediate problem which will have to be settled promptly by Washington is whether there is to be a fixing of pulp prices. That could happen in the case of domestic or even Canadian pulp. However, would demand is such that if price fixing were applied to imported pulp the Scandinavians readily could refuse to ship and could get better prices in other parts of the world than any presumable fixed United States price.

Sweden and Finland are not parties to the North Atlantic pact, so would not be subject to international controls applicable to those nations which are members. If the North Atlantic nations should try to force Sweden and Finland into line by refusing purchases at more than the United States level there still would not be the available inventories available for export to the United States that existed a year ago.

The United States undoubtedly will apply export control to hold any material tonnage of pulp for use at home, cutting off the present volume of exports. While North American pulp production is definitely on the upgrade, European production is likely to be lower than a year ago.

On the domestic side, the availability of sulphur and chlorine is likely to be troublesome. Sulphur is likely to be at least 10 per cent, and possibly 15 per cent, below last year's usage. Chlorine is likely to be short from 5 to 10 per cent.

The impact of the pulp situation on paper is yet to be appraised. There seems to be a general anticipation that there will be some standardization of grades put into effect both to conserve pulp and to save the lost time and cost of machine changes to modify paper content to suit special requests. The aim will be to secure a greater yardage from the available pulp—this might mean limitations on weights.

In the over-all picture, there is no fear of any immediate allocation of pulp as was seen in World War II, but allocations of sulphur and chlorine are almost certainly in the making. There are

and will be problems of supply for the various governmental agencies, military and civilian, but an outstanding feature of the situation was the manner in which governmental agencies, including both career men and executives borrowed from industry because of their knowledge of paper, were present to assist in every way in preparing for a smooth movement of paper to meet the Government's requirements with the least possible dislocation of industrial operations. In this respect, conditions today are far ahead of what they were when the World War II War Production Board was being born and weaned.

The convention opened with formal meetings on Monday, February 19, though some groups held preliminary committee conferences as early as Saturday, February 17. From Monday through Friday one group after another met to discuss its special problems. Divisional associations and other groups not formerly part of the American Paper and Pulp Association hegemony filled the various meetings rooms at the hotel, while the parent Association's various special committees discussed specific problems such as industrial relations, statistical procedures and the like. Pulpwood production prospects were no small part of the discussions, going back to the raw wood from which pulp is produced.

The general industry meeting at which outstanding speakers discussed special industry problems has become a convention fixture during the afternoon preceding the closing banquet, Thursday night. This year the subjects included community relations between the industry and its employees and home town activities, pulp production problems, Washington traiff legislation and legal aspects of Association work as affected by antitrust laws.

As is customary, the annual banquet was featured by a speaker from outside the industry on problems of national import.

Read highlights of PAPER WEEK as presented in this section:

APPA holds 74th annual convention

Technical Association meeting

University of Maine honors Dr. McKee

SAPI presents first life membership to George K. Gibson

Divisional Group Meetings

TAPPI Abstracts (begin on page 1342)

PLANS WERE FORMULATED last month for the 1951 annual meeting of The American Pulp and Paper Superintendents Association which will be held in Portland, Oregon, June 24-28. This group met in Portland to discuss arrangements. Left to right: Seated—L. R. Hartman (Weyerhaeuser), Program, and Chairman, Pacific Coast Division; Harry E. Weston, (secretary-treas. of the national Association), National Convention Manager; Chas. E. Ackley (Crown-Zellerbach), national president of the Association; Gus Ostenson, (Crown-Zellerbach), Convention Chairman; Standing—Burke Morden (Morden Machine Co.), Housing and Registration; L. M. Shanaman (Pennsylvania Salt), Golf; R. T. Petrie (Black-Clawson), Local Transportation; R. D. Baer (Griffith Rubber Mills), Ladies Program; C. W. Richen (Crown-Zellerbach), Woods Trip; W. A. Salmonson (Paper and Pulp Mill Supplies), Entertainment; L. B. McGlothlin (Crown-Zellerbach), Advisory; H. R. Russell (Everett P&P Co.), Program; M. E. Norwood (St. Helens P&P Co.), Mill Visits; G. F. Alcorn (Weyerhaeuser), Advisory; and R. M. True (General Dyestuff Corp.), Finance. . . . . Committee members not present for the photograph: Z. A. Wise (Griffith Rubber Mills), Publicity and Travel; H. A. Des Marais (General Dyestuff), Reception; J. N. Fulton, (Pacific Coast Supply Co.), Ladies Program; and F. R. Armbruster (Dow Chemical Co.), Advisory.

Coming Events

Mar. 13—Lake States Section of TAPPI will meet at Stevens Point, Wis.

Mar. 22—Delaware Section of TAPPI will meet at the Engineers Club, Philadelphia.

April 3—Meeting of Metropolitan Section of TAPPI; subject will be "Machinery innovations in the industry."

April 5—Kalamazoo Valley Section of TAPPI will meet jointly with the Michigan Division of The Superintendents Association, at Hotel Harris, Kalamazoo, Mich., rather than at the Columbia Hotel as previously announced.

April 13—Annual meeting of Pacific Coast Section of TAPPI; featuring annual Shibley Award contest.

April 17-20—20th National Packaging Exposition of the American Management Association, in Atlantic City, N.J.

April 30-May 4—Materials Handling Conference, sponsored by American Material Handling Society, will be held in Chicago in conjunction with the Society's Materials Handling Exposition.

May 1—Metropolitan Section of TAPPI will meet; subject will be announced at a later date.

May 4-5—Spring meeting of the Northwestern Division of the Superintendents Association, to be held at the Radisson Hotel, Minneapolis, Minn.

May 4-5—Southeastern Division of the Superintendents Association will hold its Spring Meeting at The Jefferson Hotel, Richmond, Va.

May 7-11—Greater New York Industrial Show, sponsored by New York Technical Societies Council, at the Armory, New York.

May 11-12—Spring Meeting of the Pennsylvania-New Jersey-Delaware Division of the Superintendents Association, to be held at the Hotel Easton, Easton, Pa.

May 25—The Spring Meeting of the Miami Valley Division of the Superintendents Association will be held at the Piqua, Ohio, plant of Orr Felt and Blanket Co.

June 3-6—Set-Up Paper Box Competition will be a feature of the 33rd annual meeting of the National Paper Box Manufacturers Association, to be held in Atlantic City.

June 7-9—Summer meeting of the Technical Section of CPPA, to be held at Bigwin Inn, Lake of Bays, Ont., Canada.

June 24-29—Annual meeting of the Superintendents Association to be held at Multnomah Hotel, Portland, Ore.

Sept. 14-15—Fall meeting of the Northwestern Division of the Superintendents Association to be held at the Northern Holiday Resort, Marenisco, Mich.

Oct. 8-12—39th annual congress of the National Safety Council, Chicago, Ill. Headquarters will be in the Stevens Hotel; other schedules and program details to be announced later.

Oct. 10-12—A joint meeting of the Southern and Southeastern Divisions of the Superintendents Association will be held at the George Washington Hotel, Jacksonville, Fla.

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Pointers on Pumps

WHAT HAPPENS WHEN THE SPEED OF A CENTRIFUGAL PUMP IS CHANGED?

The characteristics of a centrifugal pump are revealed by curves showing the relation between developed head and capacity, and between brake horsepower and capacity. These curves are usually based on a constant speed and a definite impeller diameter. When the pump's speed is changed, the resulting changes in its performance curves can be predicted by a few calculations. For every point on the original curves there is a corresponding point on the curves for the new speed — and by plotting a sufficient number of these points, curves can be drawn to show the pump performance at the new speed.

HOW TO PLOT THE PERFORMANCE CURVES FOR A 4" PUMP AT 1600 RPM WHEN THE CHARACTERISTICS AT 1750 RPM ARE KNOWN

GPM = gallons per minute RPM = revolutions per minute
H = head in feet BHP = brake horsepower
At constant impeller diameter:

$$\frac{GPM_2}{GPM_1}=\frac{RPM_2}{RPM_1}=\frac{\sqrt{H_2}}{\sqrt{H_1}}=\frac{\sqrt[3]{BHP_2}}{\sqrt[3]{BHP_1}}$$

Taking 900 gpm and 80 ft. head at 1750 rpm as point number 1, then:

$$GPM_2=\left(\frac{RPM_2}{RPM_1}\right)GPM_1=\left(\frac{1600}{1750}\right)900=823\ GPM$$

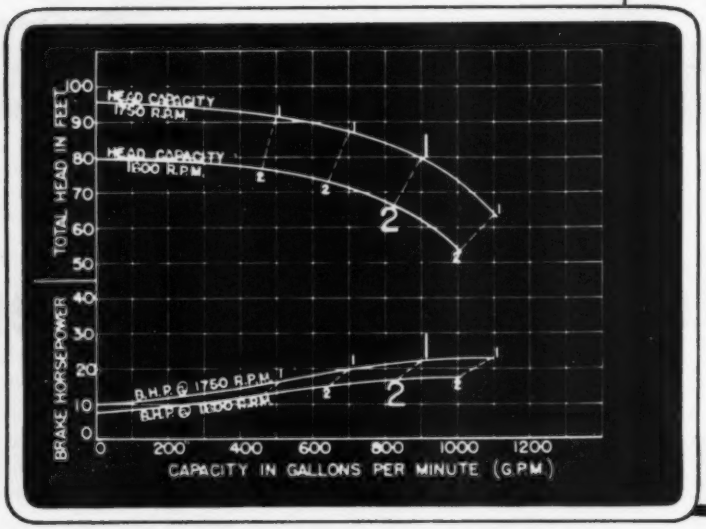
$$H_2=\left(\frac{RPM_2}{RPM_1}\right)^2H_1=\left(\frac{1600}{1750}\right)^2 80=66.8\ Feet$$

$$BHP_2=\left(\frac{RPM_2}{RPM_1}\right)^3BHP_1=\left(\frac{1600}{1750}\right)^3 22=16.8\ BHP$$

By taking other points for number 1, such as 500 gpm at 91 feet, 700 gpm at 87 feet and 1100 gpm at 64 feet, enough corresponding number 2 points are located to draw the expected 1600 rpm performance curve.

NOTE: It is also possible to predict the effect of changing the impeller diameter at a constant speed, by applying the basic formula:

$$\frac{GPM_2}{GPM_1}=\frac{Diameter_2}{Diameter_1}=\frac{\sqrt{H_2}}{\sqrt{H_1}}=\frac{\sqrt[3]{BHP_2}}{\sqrt[3]{BHP_1}}$$


TOTAL HEAD IN FEET
HEAD CAPACITY 1750 R.P.M.
HEAD CAPACITY 1600 R.P.M.
BRAKE HORSEPOWER
B.H.P. @ 1750 R.P.M.
B.H.P. @ 1600 R.P.M.
CAPACITY IN GALLONS PER MINUTE (G.P.M.)

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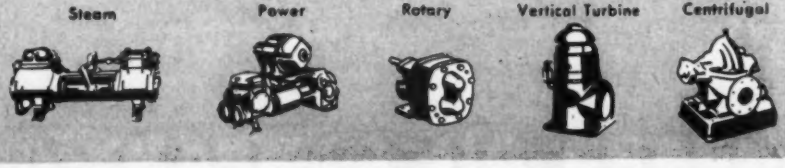


APPA holds 74th annual convention

▸▸▸ CONFRONTED WITH many problems arising from the current national emergency, the American Paper and Pulp Association met at the Waldorf-Astoria Hotel in New York for its 74th annual convention the week of February 19. More than 1,000 members gathered for the parent Association's meetings, and large numbers assembled among the various affiliated divisional and group meetings.

The theme of the conclave had been established before the meetings began; on February 8 the National Production Authority had issued a set-aside order of 5-10 per cent on paper and board to insure the filling of government orders. At the outset of the convention, however, industry leaders appeared hopeful, notwithstanding their realization of the tasks ahead. Since World War II, the industry has been expanding continuously. With co-operative effort and judicious administration, it is believed that the 1951 output will be adequate for the demand.

President Olmsted said: "the P&P industry did its best job of all time"

In review of the Association's activities of the past year, and answering the challenge that faces the paper industry in the present world situation, the APPA president, George Olmsted, Jr., sounded the following keynote:

If the production rate of the pulp and paper industry is to keep on rolling at present levels the industry must supply able men for the staff of government emergency agencies so that a control job may be ably done.

In the year just passed the pulp and paper industry did its best job of all time. It made available more of its products than ever before. These products were of better quality than ever before and they were reasonably priced.

We are more than the sixth largest industry in the country. We are an essential, a vital industry; for every business office, every factory and every home in this nation uses paper.

Maintaining present production and the complicated system of distribution that gets our products to the user at the right time and at a fair price will require the greatest possible co-operation with the emergency government agencies that have been created to handle the present situation.

George Olmsted, Jr., re-elected president of American Paper and Pulp Association

E. W. Tinker continues as executive secretary of American Paper and Pulp Ass'n

The paper industry is making every effort to staff these agencies with top flight talent; second stringers will not do. They must be capable and experienced men if we are to be sure that the government gets its guns, so to speak, while the civilian population gets as much butter as is humanly possible under the circumstances.

Two great changes in the Washington scene give hope that all of this can be accomplished. The one change is that a single man over-rides both the production and price control agencies. There is a better chance now, therefore, than there was in World War II, that the extremely delicate balance between price and production can be fairly maintained.

The second major change is that so-called "dollar a year men" can now be accepted in all government economic control agencies. This was not true in the last war. But, being true today, we can get more capable people to take on government service.

This industry has a vital obligation to government and a vital obligation to its customers—the American public. We are making every human effort to protect the interests of both.

Secretary Tinker's report optimistic

Confidence in the outcome of administrative supervision and faith in the ability of the industry to meet the challenge it now faces were expressed in the report delivered before the Association by its executive secretary, E. W. Tinker. He said in part:

"Over the past ten years, the pulp and paper industry has almost doubled in size. It has been characteristic of the industry that responsible executives are constantly seeking opportunities for expansion where such expansion can be based upon sound economics. This has been true in the past and it will be true in the future, barring unwarranted interference. . . ."

"The impact of the rearmament program was sudden. All elements have led to fears of shortages. However, unbiased analysis of the record indicates beyond question that the pulp and paper industry can meet the country's essential requirements, and, further than that, it can and will expand on its own initiative without stimulus in the form of government financing. The fact of the matter is that the use of government funds on new projects would indicate their speculative character.

"Perhaps excessive taxation and legalistic rituals over the next few years will stultify industrial expansion in the United States. The pulp and paper industry, of course, would not be impervious to the effects of these programs. However, I am encouraged to think that the Congress of the United States is becoming increasingly aware of the danger to the very mechanism wherein lies our strength and it is to the wisdom of the Congress that we must turn if

we are looking for hope of future industrial development to meet the needs of our growth."

Speaking of the industry's outstanding record in 1950, Mr. Tinker said, "In every classification there was a substantial increase in production in 1950 over 1949. This was true even in the field of newsprint where production rose by 10.8 per cent to a total of 1,017,322 tons. In the field of fine papers, production increased by about 20.5 per cent, while the average increase of paper production was 16 per cent or nearly a million and a half tons. Paper and paperboard production rose from a total of 20,327,000 tons to 24,300,000 tons, an increase of 19.5 per cent."

"Of course, the production of paper and paperboard is contingent upon an available supply of fiber. Of particular concern is the supply of virgin fiber in the form of wood pulp. Production of wood pulp presents an enviable record. During 1950, production averaged 1,235,500 tons monthly, with a cumulative production for the year of 14,827,152 tons, an increase of 2,655,000 tons over the comparable period in 1949. Due to record consumption there has been a slight decline in inventories, but in anyone's book the record indicates a real achievement.

Present officers re-elected

At the annual meeting of the Association's Board of Governors and Executive Committee, held February 22, reports of the Committee reviewing the progress of the year were presented. These reports included such subjects as public affairs and pending legislation, research, statistical procedures, Washington developments, traffic conditions and industrial relations.

As a result of the annual election, George Olmsted, Jr., president of S. D. Warren Co., was re-elected president of the Association for another year. All of the vice presidents were re-elected except for the substitution of J. R. Kimberly, vice president of Kimberly-Clark Corp., for R. L. Fitts, of Southern Advance Bag Co., who has asked to be relieved of this duty. The list of vice presidents includes twelve outstanding leaders of the industry in addition to Sydney Ferguson, chairman of the board of The Mead Corp., who was re-elected as first vice president.

Turcotte presents wood pulp record of 1950

At the open meeting of the Association on February 22, L. Turcotte, president of Puget Sound Pulp & Timber Co., Bellingham, Wash., gave a highly informative address on "The Pulp Situation." His remarks were filled with interesting data and statistics. A few highlights follow:

"Domestic production approaching 15 million tons, augmented by imports considerably over two million tons, gave wood pulp consumers in the United States more than 17 million tons of new supply in 1950 and yet, at the end of the year in which new production and import records were set, there was a shortage of pulp. With other pulp-hungry countries bidding up prices, a substantial change in import supply sources developed, creating a situation of direct concern to consumers who depend upon market pulp to meet their requirements."

"This nation's mills turned out 14,776,000 tons of wood pulp in 1950, against 12,185,000 tons in 1949, and topped the previous production record of 12,872,000 tons made in 1948. Imports supplied the industry with 2,377,000 tons, in comparison with 1,763,000 tons in 1949, and 2,176,000 tons in 1948. Exports took just 93,000 tons in 1950, leaving 17,060,000 tons of new supply for domestic use, compared with 13,852,000 tons in 1949, and 19,946,000 tons in 1948."

"Throughout 1950, the trend of domestic production was upward, with the best gain being shown in the final quarter. Total output rose from an estimated 3,475,000 tons in the first quarter to 3,635,000 tons in the second quarter, 3,710,000 tons in the third quarter, and 3,956,000 tons in the fourth quarter."

"If we review these figures which I have given you on production and imports for the three years of 1948-1949-1950, it is plain to see that the production loss of 1949 has been a severe blow to the pulp consumer in the United States and one from which the supply and demand situation has not yet recovered.

Mr. Turcotte closed his address with summarized suggestions as follows:

First: That the next time business slacks off a little take a good look at the world supply situation, and this applies to wood as well as pulp supply. Add to your inventory instead of depleting it. All, of course, within one's financial ability to do so. This will minimize loss of productive capacity, and will make for steadier prices.

Second: New pulp facilities will be constructed to provide for our increasing population to provide for new development in fibre uses, to maintain our high standard of living, but they will, of necessity, have to be built in more remote areas where there is ample timber. This will also give our more accessible timber lands a chance to grow more timber per acre, by delaying the cutting of too young trees.

Third: Production costs in newer plants will be high so we must be ready to accept a much higher plateau of prices, and this is more or less true of all raw materials.

And Last: The wood supply for pulp manufacturing is in good shape for our domestic use, but world demand for pulp without a world supply of raw materials will make for a very close situation in supply and demand for a long time to come.

Alex. Heron asks: What is the still, small voice?

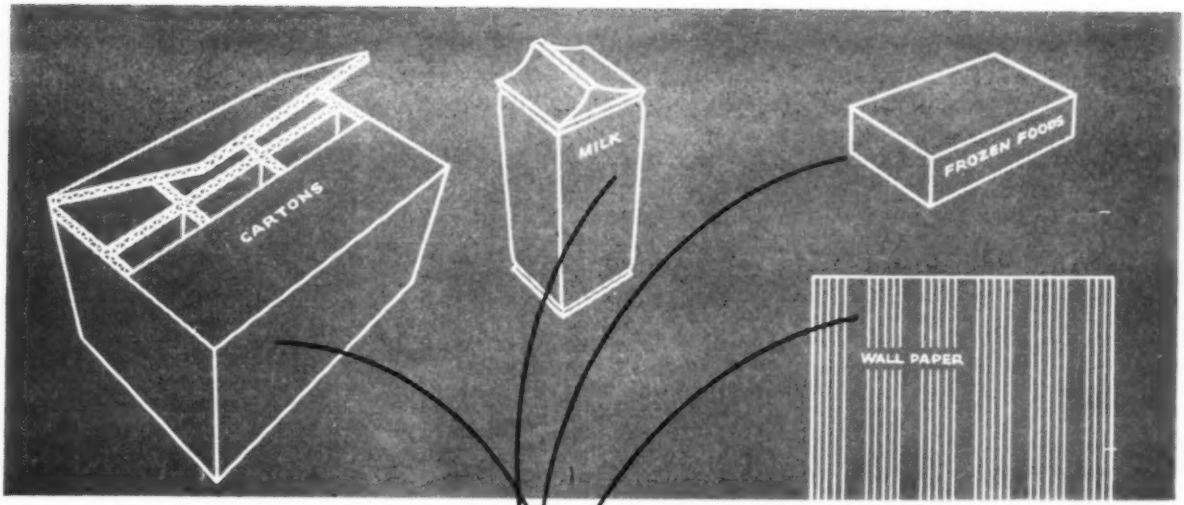
Featured speaker at the open meeting of the Association was Alexander R. Heron, vice president of Crown Zellerbach Corp. Mr. Heron spoke on the subject "Somebody is always listening." As a long time executive in industrial and public relations and the author of several books on industrial relations, Mr. Heron gave a most constructive and helpful address. He outlined points for a better understanding of our American business system; the daily behavior of those who are classed as the business men of America. "What is that still, small voice?" In answering this question, he said it is the daily behavior of those who are classed as the business men of America; it is the behavior of the president of the corporation, the personnel office, and the foremen on the job; it is the attitude of the gate watchman, and the tone of the telephone operator; it is the response of management people to the expression of an employee grievance, and the pricing policy of the super market.

Mr. Heron said that some of us have been given the responsibility of helping to plan for a better understanding of the American pulp and paper industry; better understanding by the people who work in the industry, the people who manage the industry, the people who use its products, and the people who administer government regulations on some of its activities.

"We need," he said, "one simple foundation for the understanding of our American business system. It must be so simple that all of us in management can agree upon it. It must be so simple that everyone who works in American industry can accept it. It must be proved, and it must furnish the explanation which will make it possible for us to work together as a team."

Henry J. Taylor is speaker at APPA Dinner

Highlighting the activities of Paper Week was the APPA dinner meeting held at the Waldorf-Astoria on the evening of February 22. Guest speaker at the dinner was Henry J. Taylor, noted radio news commentator. Mr. Taylor gave a fine performance, lending the personal touch to his usual fine program style. He spoke mostly on the Korean situation.



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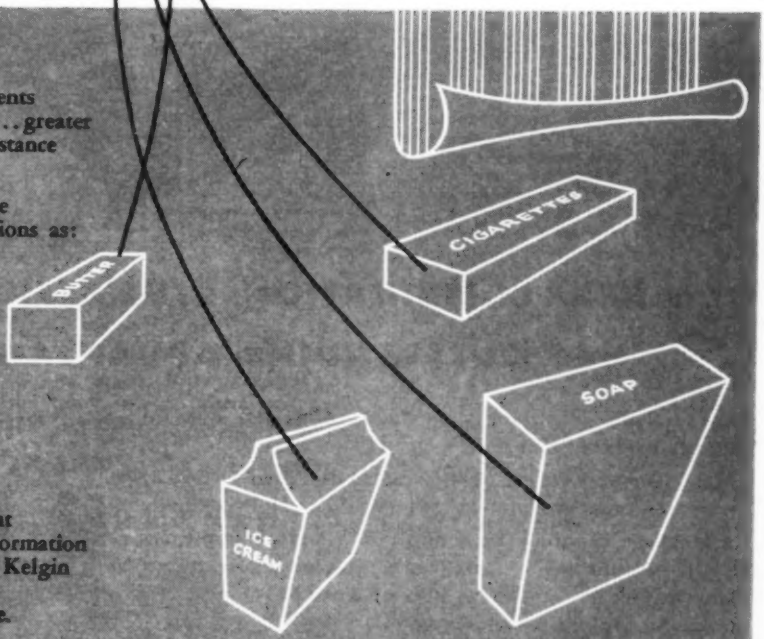

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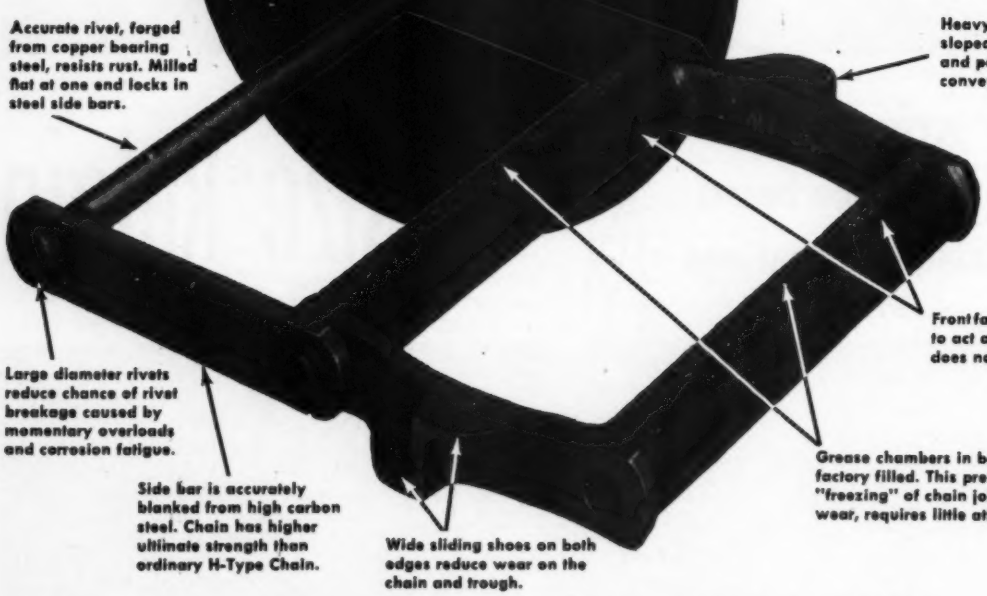
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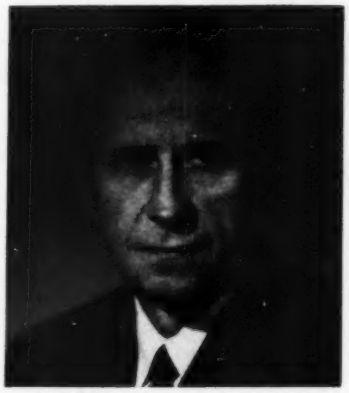


K. P. Geohegan, newly-elected president of the Technical Association

Albert E. Bachmann, retiring TAPPI president; he served two terms

J. D. Zellerbach, TAPPI luncheon speaker, has been on ECA special mission to Italy

Technical Association Meeting

▶▶▶ The 36th Annual Convention of the Technical Association of the Pulp and Paper Industry was held at the Commodore Hotel in New York, February 19-22, with a registration list of over 1600 persons. This meeting was one of the largest in the history of the Association. More than 100 papers were presented during the technical sessions. One of the more important events at the Annual Luncheon on the last day of the convention was the presentation of the TAPPI Medal to George H. Tomlinson, Howard Smith Paper Mills, Ltd., Montreal, Canada. Another highlight was the address, "A Technique for Freedom," by J. D. Zellerbach, president of Crown Zellerbach Corp. and former chief of the ECA special mission to Italy.

At the opening session, newly elected officers were announced. Kenneth P. Geohegan, Howard Paper Mills, Inc., is the new president and George H. Pringle, Mead Corp., is the new vice president. New members of the executive committee are as follows: William F. Hathaway, Kalamazoo Vegetable Parchment Co.; Walter F. Holzer, Crown Zellerbach Corp.; Ward D. Harrison, Riegel Paper Co.; James Lientz, Union Bag and Paper Corp.

In his annual report, R. G. Macdonald, secretary of TAPPI, recounted the activities of the Assocition during the past year. Most important were the six functional meetings held during the year by the various divisions and committees of the Association. These meetings, which reflected the high interest of the members, were as follows: Fundamental Research Conference, Testing Conference, Fifth Engineering Conference, Plastics Conference, Alkaline Pulping Conference, and the Fibrous Agricultural Residues Conference.

The Joint Textbook Committee reported that Vol. I, "Preparation and Treatment of Wood Pulp," which was published in the fall of 1950, will be followed in due time by Vol. II, "The Preparation of Stock for Paper and Board," Vol. III, "Manufacture and Testing of Paper," and Vol. IV, "Auxiliary Pulp and Paper Mill Equipment." These volumes are in various stages of preparation, and the exact date of their publication cannot be predicted at the present time.

Technical Program

General Session

A. E. Bachmann, President of TAPPI, Missisquoi Corp., Sheldon Springs, Vt., presiding.

Chemical Engineering Unit Operations in the Pulp and Paper Industry, by W. L. Badger, Ann Arbor, Mich.

Water

A. S. Erspamer, P. H. Glatfelter Co., Spring Grove, Pa., presiding.

Controlling Stream Pollution in Pennsylvania, by J. R. Hoffert, Sanitary Water Board, Harrisburg, Pa.

Correlation of B.O.D. and Chemical Tests on Industrial Effluents, by K. G. Chesley, R. W. White and R. V. Hogg, Jr., Crossett Paper Mills, Crossett, Ark.

Operation of the Bird-Gibbs Flotation Save-all, by J. E. Fitzgerald, Bird Machine Co., So. Walpole, Mass.

Scott Paper Co. Waste Disposal Plant, by David R. Wadleigh, Scott Paper Co., Chester, Pa., and L. G. Simons, Chas. T. Main, Inc., Boston, Mass.

Experimental Chemical Treatments for Kraft Mill Waste, by William Moggio, National Council for Stream Improvement, New York, N.Y.

Structural Fibrous Materials

John F. Campbell, Flintkote Co., Meridian, Miss., presiding.

Light Reflection Measurements as Related to Decorative Insulation and Acoustical Products, by Richard S. Hunter, Henry A. Gardner Laboratory, Bethesda, Md.

Preservation of Fiber Insulating Board with Copper Pentachlorophenate, by E. A.

George H. Tomlinson is 1951 TAPPI Medalist

George H. Tomlinson

AWARD OF THE nineteenth medal of the Technical Association of the Pulp and Paper Industry was made officially to George H. Tomlinson at the annual TAPPI luncheon held February 22, 1951, at the Commodore Hotel in New York City.

Presentation of the award was made by J. N. Stephenson, of the Pulp and Paper Magazine of Canada. Mr. Tomlinson was chosen for this honor because of his valuable work in the development of pulp manufacture, especially in the economic utilization of the by-products. His many accomplishments include: continuous vacuum brown stock washing, multiple stage evaporation, stationary recovery furnaces, continuous causticizing, lignin plastics, and the magnesium bisulphite process.

Mr. Tomlinson is vice president and a director of the Howard Smith Paper Mills Ltd., Montreal, P.Q. He was born in Toronto and received his education at Upper Canada College and Trinity College in Toronto.

Behr and A. J. Hubert, Jr., A. D. Chapman Co., Memphis, Tenn.

Insulation Board Products and Their Relation to Various Building Codes, by Charles Gray, Insulation Board Institute, Chicago, Ill.

Trends in the Insulation Board Industry, by J. O. Burton, Minnesota & Ontario Paper Co., International Falls, Minn.

Flame-Resistant Surface Insulation Board and Methods of Test, by J. J. Perot, Whippany, N.J.

Report on Insulation Board Institute Technical Committee Activities and Problems, by E. M. Jenkins, Johns-Manville Corp., Manville, N.J.

Report on Progress of Finished Products Testing Sub-committee and Future Program, by Emile Frederick, Jr., Celotex Corp., Marrero, La.

Report on Progress of Raw Materials Testing Sub-Committee and Future Program, by E. M. Jenkins, Johns-Manville Corp., Manville, N.J.

Discussion of Freeness Testing and Test Board Formation, by the Raw Materials Testing Sub-committee.

Plastics

E. C. Jahn, New York State College of Forestry, Syracuse, N.Y., presiding.

Configuration and Structure of Cellulose Xanthate, by C. Y. Chen, Ralph E. Montonna, and C. S. Grove, Jr., Syracuse University, Syracuse, N.Y.

The Bonding Strength of Certain Adhesives on Liner Board, by Geoffrey Broughton and Ernest R. Kaswell, Fabric Research Laboratories, Boston, Mass.

Redwood Plastic Pulp for Phenolic Resin Laminates, by T. A. Howells and R. H. Goms, Institute of Paper Chemistry, Appleton, Wis.

The Properties of a New Vinyl Chloride-Vinylidene Chloride Latex for Paper Coating, by Elmer K. Stilbert and H. L. Clack, Dow Chemical Co., Midland, Mich.

Alkaline Pulping

Henry Vranian, Chesapeake Corp. of Virginia, West Point, Va., presiding.

The Properties of High Yield Kraft Pulps Products at Bathurst, by J. McK. Limerick, Bathurst Power and Paper Co., Ltd., Bathurst, N.B.

Rate of Beating of Pre-Refined Kraft Pulps, by H. Wyatt Johnston, Sutherland Refiner Corp., Montreal, P.Q. and W. C. Lodge, Pulp and Paper Research Institute of Canada, Montreal, P.Q.

Further Studies on the Alkaline Pulping of Scrub Oak, by C. W. Rothrock, Jr., and William J. Nolan, University of Florida, Gainesville, Fla.

Redwood as a Potential Source of Pulp, by Harry F. Lewis, Institute of Paper Chemistry, Appleton, Wis.

Some Factors in the Color Reversion of Bleached Secondary Fiber, by H. P. Bailey, J. J. Forsythe, and E. F. Andrews, International Paper Co., Niagara Falls, N.Y.

Odor Elimination in a Sulphate Pulp Mill, by P. Ghisoni, G. Bozza and P. Colombo, Vita Mayer & Co., Milano, Italy.

The Recovery of Soda and Sulphate in a French Pulp Mill, by M. Preveaux, Tanins Rey, Paris, France.

Corrugated Containers

F. D. Long, Container Corp. of America, Chicago, Ill., presiding.

Panel Session on Manufacture, Inspection and Testing of Weatherproof Corrugated Board:

New Developments in Starch Adhesives, by J. E. Killinger, Penick & Ford, Ltd., Inc., Cedar Rapids, Iowa.

Starch Urea Adhesives, by E. S. Gantt, Corn Products Refining Co., Argo, Ill.

PVA Adhesives, by E. G. Boyce, Grasselli Div., E. I. du Pont de Nemours & Co., Inc., Cleveland, O.

Silicate Adhesives for Weatherproof Corrugated Board, by Robert L. Kreyling, Philadelphia Quartz Co., Philadelphia, Pa.

Commercial Testing, by C. J. Zusi, Container Laboratories, Inc., Chicago, Ill.

Quartermaster Inspection and Testing, by Major R. E. Willett, Philadelphia Quartermaster Depot, U.S. Army, Philadelphia, Pa.

Weatherproof Corrugated Board Operating Problems, by J. J. Koenig, Gaylord Container Corp., St. Louis, Mo.

Vocational Education

B. E. Lauer, University of Colorado, Boulder, Colo., presiding.

Recruiting of College Graduates: (1) *Problems of the Recruiting Agent;* (2) *Problems of the University Placement Director,* by Gordon G. Sikes, Princeton University, Princeton, N.J.

Assimilation of the Technical Graduate into the Industry: (1) *Through an Interview and Formal Training Program,* by Robert R. Ralston and F. B. Nuelle, General Electric Co., Schenectady, N.Y.; (2) *A Short Program for the Orientation of Technical Employees in the Chemical Industry,* by O. A. Greiner, American Cyanamid Co., New York, N.Y.; (3) *Through Immediate Job Responsibility,* by Seymour J. Rose, National Adhesives Co., New York, N.Y.

Fundamental Research

Harry F. Lewis, Institute of Paper Chemistry, Appleton, Wis., presiding.

Mechanical Behavior of Paper, Part I, by Geoffrey Broughton and N. A. Matlin, Lowell Textile Institute, Lowell, Mass.

Sorption of Water-Soluble Cellulose Ethers by Cellulose, by Ellsworth Shriver, Institute of Paper Chemistry, Appleton, Wis. (Mr. Shriver is now with the Mead Corp., Chillicothe, Ohio.)

The Mechanism of Fiber Bonding, by W. S. Wilson, Monsanto Chemical Co., Everett, Mass.

The Effect of Urea and Related Compounds on the Mechanical Properties of Paper, by Henry D. Fisher, Institute of Paper Chemistry, Appleton, Wis. (Mr. Fisher is now with the Scott Paper Co., Chester, Pa.)

The Preparation and Properties of Periodate Lignins, by Manning A. Smith, Bucknell University, Lewisburg, Pa.

Papermaking (Fourdrinier)

Noel R. Phillips, Champion Paper & Fiber Co., Canton, N.C., presiding.

Symposium on Fourdrinier Wet-End Variables: (1) *Slices,* by Paul Boronow, Valley Iron Works, Appleton, Wis.; (2) *Paper,* by B. L. Kassing, Nekoosa-Edwards Paper Co., Port Edwards, Wis.

Statistics

T. A. Pascoe, Nekoosa-Edwards Paper Co., Port Edwards, Wis., presiding.

Statistical Techniques in Maintenance of Testing Instruments, by W. Edmund Patte, E. B. Eddy Co., Hull, P.Q.

Case Studies in the Application of Industrial Statistics to Papermaking, by Charles A. Bicking and Richard T. Trelfa, Hercules Powder Co., Wilmington, Del.

Nomographic Assistance in Statistical Calculations, by W. E. Patte, E. B. Eddy Co., Hull, P.Q.

The Calculation of Mullen, by Edward R. Hoffman, Hammermill Paper Co., Erie, Pa.

Groundwood Bleaching Variables, A Statistical Approach, by F. R. Sheldon, Buffalo Electro-Chemical Co., Buffalo, N.Y.

Chemical Engineering

J. R. Lientz, Union Bag & Paper Corp., Savannah, Ga., presiding.

An Industrial Lecture Program for Students of Chemical Engineering, by Lyle C. Jenness, University of Maine, Orono, Me.

Symposium on Digester Construction and Operation: (1) *Factors Influencing Service Life of Brick Linings in Sulphite Digesters,* by Beaumont Thomas, Stebbins Engineering & Mfg. Co., Watertown, N.Y.; (2) *Corrosion of Mild Steel and Mild Steel Welds in Sulphate Digesters,* by R. A. Huseby and M. A. Scheil, A. O. Smith Corp., Milwaukee, Wis.; (3) *The Effect of Silica on Digester Corrosion,* by J. C. Hair and A. W. Duskin, Crossett Paper Mills, Crossett, Ark.; (4) *Progress Report on the Activities of the Digester Corrosion Subcommittee,* by H. O. Teeple, International Nickel Co., New York, N.Y.

Paperboard Drying: An Investigation by Means of an Experimental Drying Machine, by Stanley F. Smith and B. W. Atwood, St. Anne's Board Mill Co., Bristol, England.

Wet Strength

K. W. Britt, Scott Paper Co., Chester, Pa., presiding.

The Role of the Hemicelluloses in the Mechanism of Wet Strength, by M. N. Fineman, Rohm & Haas Co., Philadelphia, Pa.

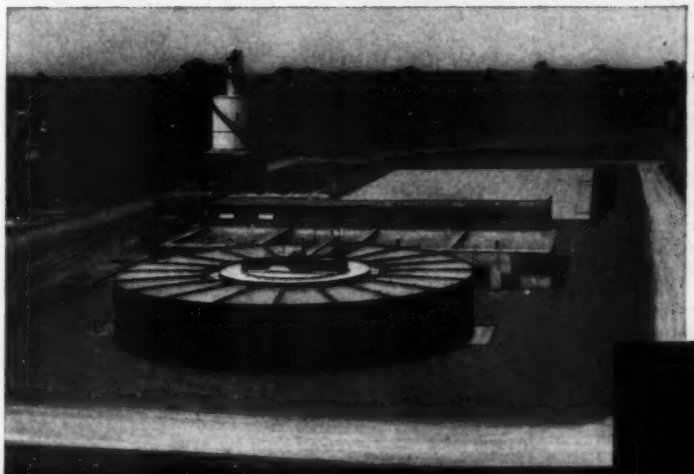
The Mechanism of the Improvement of Wet Strength of Paper by Polyethylenimine, by Paul E. Trout, Institute of Paper Chemistry, Appleton, Wis. (Mr. Trout is now with the American Box Board Co., Filer City, Mich.)

Factors Affecting Retention and Efficiency of Wet-Strength Resins, by C. S. Maxwell, W. F. Reynolds, and R. R. House, American Cyanamid Co., Stamford, Conn.

The Rate of Wet-Strength Development in Neoprene-Containing Papers, by G. W. Wheeler, A. M. Borders, G. R. Sears, and J. W. Swanson, Institute of Paper Chemistry, Appleton, Wis.

Phenol-Formaldehyde Resins for Wet-Strength Paper, High Resin Contents by the Beater Addition Process, by Francis H. Snyder, L. Spiwak, and A. E. Moyer, Snyder Chemical Co., Bethel, Conn.

Panel Discussion on Practical Aspects of Wet-Strength Paper Manufacture.



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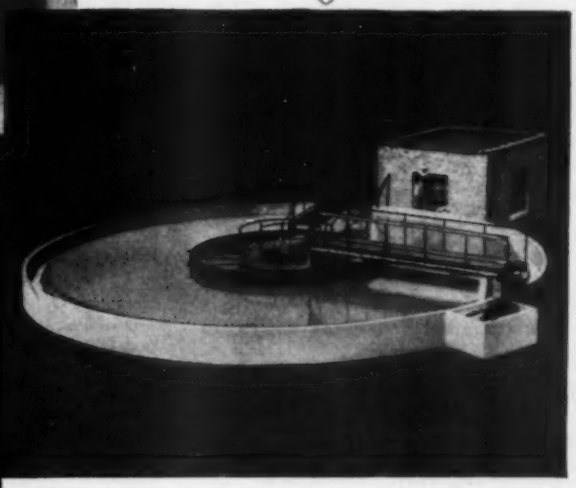

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Preparation of Papermaking Materials

The Influence of Temperature During the Beating Process, by O. K. Ronning, E. D. Jones & Sons, Inc., Pittsfield, Mass., and C. E. Libby, New York State College of Forestry, Syracuse, N.Y.

Description and Action of the Morden Slush-Maker Pulper, by R. Burke Morden, Morden Machines Co., Portland, Ore.

Pulping of Waste Papers and Pulp in the Dynopulper, by G. A. Peterson, Rice Barton Corp., Worcester, Mass.

The Sandy Hill Peppy Peeler, by Douglas Philbrook, Northeast Pulpwood Research Center, Gorham, N.H.

The Cadara Refiner, by P. Centerick, Papeteries de Belgique, Duffel, Belgium.

Testing

James d'A. Clark, Research Development Engineer, Longview, Wash., presiding.

Toward a Referee Viscosity Method for Cellulose, by A. F. Martin, Hercules Powder Co., Wilmington, Del.

Moisture Determination in Paper by Oven Drying, by Geoffrey Broughton and A. K. Hobbs, Lowell Textile Institute, Lowell, Mass.

Effect of Melamine Resin on Chemical Tests for Paper, by W. K. Wilson, J. L. Harvey and A. J. Padgett, National Bureau of Standards, Washington, D.C.

Characterization of Petroleum Waxes by Solvent Fractionation Methods, by F. H. MacLaren, Standard Oil Co., Whiting, Ind.

Determination of Iron in Wood and Wood Pulp, by R. M. Kingsbury, Forest Products Laboratory, Madison, Wis.

Microbiological

R. F. DeLong, Marathon Corp., Rothschild, Wis., presiding.

Relation of Red Slimes to General Paper Mill Slime Control, by J. R. Sanborn, National Aluminate Corp., Chicago, Ill.

A New Method for Detecting Slime in Pulp and Paper, by Stanley J. Buckman and Virginia Henington, Buckman Laboratories, Memphis, Tenn.

Pink Slimes in Paper Mills—Identification and Control of Certain Causative Organisms, by John W. Appling, N. Jean Ridenour and Stanley J. Buckman, Buckman Laboratories, Memphis, Tenn.

Microbiology of Certain Food Containers, by Ernest Reed, Syracuse University, Syracuse, N.Y.

Paper, by Representative of Dow Chemical Co., Midland, Mich.

Acid Pulping

John M. McEwen, Pulp Div., Weyerhaeuser Timber Co., Everett, Wash., presiding.

Commercial Sulphite Production Experience with Ammonia Base, by L. A. LaFond and W. F. Holzer, Crown Zellerbach Corp., Lebanon, Ore., and Camas, Wash.

Chemical Reaction Equilibria in Calcium and Magnesium-Base Sulphite Recovery Systems, by Roy P. Whitney, Richard M. Elias and Malcolm N. May, Institute of Paper Chemistry, Appleton, Wis.

The Determination of Total Non-Aqueous Constituents in Pulp Mill Liquors, by James H. Phillips, Babcock & Wilcox Co., Alliance, O.

The Sulfox Process for Recovery of Chemicals from Acid and Neutral Sulphite Waste Liquors, by R. S. Aries and Arthur Pollak, R. S. Aries and Associates, New York, N.Y.

Ash in Sulphite Pulp, by F. Wultsch and F. Senger, Technical University of Graz, Graz, Austria.

Papermaking (Cylinder)

J. J. Harrison, Michigan Carton Co., Battle Creek, Mich., presiding.

Instrumentation and Control, by A. T. Luey, Sutherland Paper Co., Kalamazoo, Mich.

Air Prevention and Elimination in Stock to the Vats, by G. C. Ehemann, Ohio Boxboard Co., Rittman, O.

Wire Marks—Their Cause and Means of Elimination, by Glen T. Renegar, Container Corp. of America, Manayunk, Pa.

The Mechanism of Stock Formation on a Cylinder, by Frank Hollis, Alton Boxboard Co., Alton, Ill.

Fibrous Agricultural Residues

S. I. Aronovsky, Northern Regional Research Laboratory, Peoria, Ill., presiding.

The Preservation of Baled Straw in Ricks, by C. W. White, Pacific Coast Borax Co., Cleveland, O.

Dissolving Pulp from Bamboo, by M. H. Joglekar, Timber Market, Bhusval, India, and C. P. Donofrio, New York State College of Forestry, Syracuse, N.Y.

Mechano-Chemical Process—Rate of Delignification, by S. I. Aronovsky and G. H. Nelson, Northern Regional Research Laboratory, Peoria, Ill.

Boxboard from Wheat Straw to Replace Wood Veneer in Wire-Bound Shipping Containers, by E. C. Lathrop, T. R. Naffziger, and Earl R. Stivers, Northern Regional Research Laboratory, Peoria, Ill.

Agricultural Residue Pulps — Crotalaria Pulps, by A. J. Ernst, H. M. Sutcliffe, and S. I. Aronovsky, Northern Regional Research Laboratory, Peoria, Ill.

Mechanical Pulping

F. W. O'Neil, New York State College of Forestry, Syracuse, N.Y., presiding.

Hydrogen Peroxide Bleaching of Chemical and Mechanical Pulps, by R. L. McEwen, F. R. Sheldon and D. H. Nelson, Buffalo Electro-Chemical Co., Inc., Buffalo, N.Y.

Peroxide Bleaching of Groundwood and Sulphite Pulps, by R. A. Premo, Gould Paper Co., Lyons Falls, N.Y.

Color Removal of Process Waters, by J. H. Davidson, Minnesota & Ontario Paper Co., International Falls, Minn.

The Vibrotor Screen, by Sven Fahlgren, Bird Machine Co., So. Walpole, Mass.

Effect of Recycling Spent Liquor in Semichemical Pulping, by E. L. Keller and J. N. McGovern, Forest Products Laboratory, Madison, Wis.

Poplar Growth and Its Utilization in Papermaking in Italy, by Representative of Cartiera Burgo, Torino, Italy.

Microscopy

C. E. Brandon, Howard Paper Mills, Inc., Dayton, O., presiding.

Routine Fiber Analysis of Pulps, Papers and Paperboards, by Norval F. Wilson, Alton Box Board Co., Alton, Ill.

An Optical Projection Method for Measuring Fiber Length, by Thomas Fyfe, Eastman Kodak Co., Rochester, N.Y.

The Microscopy and Identification of Synthetic Fibers, by F. D. Houghton, American Viscose Corp., Marcus Hook, Pa.

The Microscopic Identification of Paper Fillers, by Harold C. Koch, C. Edwin Brandon and Kenneth P. Geohegan, Howard Paper Mills, Inc., Dayton, O.

Some Unconventional Uses of the Microscope on Wood and Its Fibrous Products, by T. G. Rochow, American Cyanamid Co., Stamford, Conn.

A Proposed Card Sorting System for the Identification of Pulpwoods, by B. Francis Kukachka, Forest Products Laboratory, Madison, Wis.

Graphic Arts

Fred D. Elliott, Time, Inc., Chicago, Ill., presiding.

Measuring Printing Quality of Magazine Paper, by Emery Braugh, Time, Inc., New York, N.Y.

Numerical Evaluation of Printability of Paperboard, by Clyde Eckhart and L. K. Burnett, Ohio Boxboard Co., Rittman, O.

Measuring the Printing Quality of Newsprint, by Gerard Larocque, B. Axelrod and S. Clark, New York Daily News, New York, N.Y.

A Rotary Pick Tester, by W. W. Roehr, Kimberly-Clark Corp., Neenah, Wis.

Ohio TAPPI Program Devoted to Rubber Resins and Latices in Paper and Hardboard

Program for the Ohio Section of TAPPI, which was held at the Manchester Hotel, Middletown, Ohio, January 9, presented two papers on the use of rubber latices and resins in paper and hardboard manufacture.

R. A. Buck, of The Sorg Paper Co., arranged the program. Speakers included Wm. Aiken, asst. mgr., chemical division, The Goodyear Tire & Rubber Co., and Francis H. Snyder, president of The Snyder Chemical Co.

Mr. Aiken spoke on "Beater Impregnation of Rubber Latices." He discussed the variables effecting the resulting latices containing sheets under the following headings:

(a) Classes of rubbers used
(b) Methods of compounding the rubber
(c) Chemical composition
(d) Molecular weight of the rubber
(e) Percentages applied to the sheet
(f) Effect of types of pulp on results

Mr. Snyder spoke about "Some New Developments in the Beater Addition Process." His paper discussed the use of special types of phenolic resins in the manufacture of a variety of specialty papers. Mr. Snyder stressed the results attained by adding resin to the fiber at the head box. This is called the "inverted" procedure as contrasted with the "direct" in which the somewhat diluted phenolic resin is added to neutral stock in a beater followed by the addition of cation-yielding substances such as aluminum salts, acids, etc. Mr. Snyder illustrated his talk with numerous samples of products made from plastic impregnated fiber.

About 134 members and guests were present at the meeting.

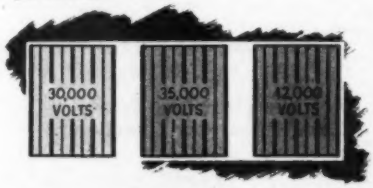
These 10 BIG Features Make Western Precipitation COTTRELLS Outstanding in the Paper Industry

When considering COTTRELL Equipment for salt cake recovery, or any other application in the paper industry, remember this . . . *Western Precipitation Corporation not only pioneered the first commercial application of* COTTRELL *equipment made in any industry, but also pioneered the first application of* COTTRELL *equipment in the paper industry.*

Among the vitally important advantages found in Western Precipitation COTTRELLS, the following are particularly important in paper mill installations ...

1 **Sustained Year-After-Year Efficiency:** The recovery efficiency of Western Precipitation COTTRELLS does not fall off in service. All parts are of ample design to maintain guaranteed over-all efficiency year-after-year —not for just a single acceptance run.

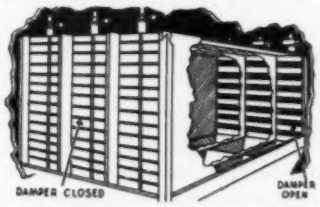
2 **Higher Recovery:** The horizontal flow design of Western Precipitation COTTRELLS eliminates collected material falling countercurrent to incoming gas stream. This assures higher recovery, minimum resuspension of recovered material in gas stream.



3 **Maximum Performance:** Horizontal flow of Western Precipitation COTTRELLS permits use of multiple electrical sections so that voltage in each section can be varied to dust loading for maximum recovery without arc-over or electrical breakdowns.

4 **Lower Over-all Cost:** When comparing COTTRELL costs, be sure to compare total *installed* cost, including duct work.

5 **Simpler Maintenance:** Because all interior parts and electrode systems are readily accessible, Western Precipitation COTTRELLS are far easier to maintain and service. Saves "down" time, saves repair costs.



6 **Greater Adaptability:** Horizontal flow design permits use of multi-vane dampers in multiple-unit installations. Thus, one unit can be shut off completely to permit maintenance operations without closing down entire Precipitator. Also, the dampers can be used in slightly-closed position to assure more uniform gas distribution.
On single-unit installations, chain curtains assure uniform distribution of gases. Curtains are easily kept clean by shaker mechanisms provided.

7 **"V"-Shaped Hoppers:** Horizontal design permits use of continuous "V"-shaped hoppers for collecting recovered material. Steeply-sloped walls in this type of hopper prevent build-up or bridging of recovered material.

8 **Space-Saving Compactness:** Not only do their horizontal design permit maximum compactness in Western Precipitation COTTRELLS, but various sections of a unit can be arranged for indoor installation in space above cascade evaporators, thus utilizing space otherwise wasted.

9 **All-Weather Construction:** Western Precipitation COTTRELLS are built for both indoor or outdoor installation, and this organization has had extensive experience with special construction to prevent excessive corrosion in rigorous northern climates.

10 **More Extensive Experience:** Since pioneering the commercial application of COTTRELL Precipitators over 42 years ago, Western Precipitation has consistently led in developing one unique advancement after another. Such features as 4-Point Electrode Suspension that eliminates misalignment of electrodes and reduction in recovery efficiencies . . . Unusually Rugged Rapper Design that assures proper cleaning of electrodes . . Extensive Experience with all types of electrode designs . and many other advantages assure you the ultimate in COTTRELL design and efficiency when you bring your recovery problems to Western Precipitation engineers.

Without obligation our nearest representative will gladly make Western Precipitation COTTRELL *experience available to you for solving your particular recovery problem. Why not contact him today?*

IMPORTANT! In addition to COTTRELL *Electrical* Recovery equipment, Western Precipitation Corporation also designs and installs the well-known MULTICLONE *Mechanical* Collectors for bagged-fuel fired boilers. These units are unusually compact, highly efficient and can be readily fitted into existing plants at minimum installation costs. *Write for details!*

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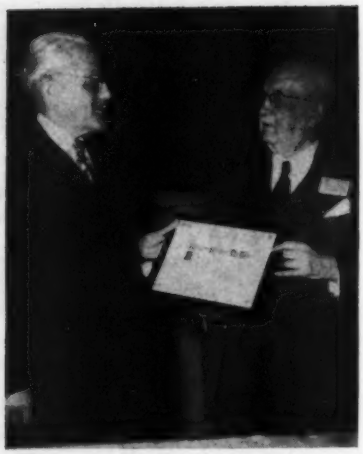
SPECIAL CEREMONIES attended the University of Maine Pulp and Paper Alumni luncheon held at the Biltmore Hotel, New York City, February 21. The University's Foundation marked its first anniversary by awarding its 1951 Honor Award—the first such award to be made by The Foundation. (Persons named below).



PRESENTATION of the 1951 Honor Award was made by J. L. Ober (left), Scott Paper Co., to Dr. Ralph H. McKee, now consulting chemical engineer, New York City

U. of Maine Foundation Honors Dr. McKee

IT HAS BECOME TRADITIONAL for the members of the University of Maine Pulp and Paper Alumni to hold a luncheon during Paper Week. The luncheon held this year (February 21) at the Hotel Biltmore in New York City was eventful.

This occasion marked the first anniversary of The Foundation, a project launched by the University just a year ago and designed to provide financial assistance to undergraduates taking the five-year program in operational management in the pulp and paper field, and to increase teaching facilities and fundamental and applied research in this field.

Speakers at the luncheon included T. C. Mangan, manager of International Paper Co. plants in Maine, who is chairman of the membership committee for the Foundation; Dean Ashley S. Campbell, head of the College of Technology at the University; and Prof. Lyle C. Jenness, head of the department of chemical engineering at the University. The chairman was Henry G. Booth of the Robert Gair Co., Uncasville, Conn.

Mr. Mangan traced the organization and development of The Foundation and listed a number of projects already accomplished and others that are now in the planning stage. He said more than 600 University of Maine men now hold responsible positions in the pulp and paper and allied industries.

Dean Campbell told of the impact of the present tense world situation on engineering education.

Professor Jenness said that the University of Maine had 26 seniors and graduate students enrolled in pulp and paper courses during the fall semester. Eight are registered for the five-year program and six are receiving scholarships from The Foundation.

Climaxing the University's Alumni luncheon and the first anniversary of The Foundation was the presentation at the luncheon of The Foundation's 1951 Honor Award, the first of its kind to be made by The Foundation. This honor was bestowed upon Dr. Ralph H. McKee, of New York. Presentation of a certificate, symbolizing the award, was made by J. L. Ober, vice president of Scott Paper Co., Chester, Pa. Mr. Ober recently was named chairman of the executive committee of The Foundation.

Briefing Dr. McGee's background, he is now a consulting chemical engineer in New York. He was graduated from Wooster College with an A.B. degree, and later received an A.M. degree and honorary Sc.D. degree from the same institution. He also holds a Ph.D. degree from the University of Chicago, LL.D. degrees from Carthage College and the University of Maine, and Doctor of Natural Philosophy degree from Tartu.

His teaching career included posts at Wooster, Carthage, Lake Forest, and Maine. He was professor of chemistry and chemical engineering at the University of Maine from 1909-1916. Later he held a number of responsible positions with industrial firms and with the Government and was professor at Columbia University from 1918-1939.

The Honor Award presented to Dr. McKee read in part as follows:

"In recognition of his initiating and establishing the first college course of pulp and paper technology in the country at the University of Maine in 1913; and in further recognition of his invaluable service to the University and the pulp and paper industry as an educator and administrator."

PHOTO GROUP:

First row (seated)—Dean Ashley S. Campbell, University of Maine; J. L. Ober, vice pres., Scott Paper Co., Chester, Pa.; Dr. Ralph H. McKee, consulting chemical engineer, New York City; Clifford Patch, Eastern Corp., Brewer, Maine; Henry G. Booth, Robert Gair Co., Uncasville, Conn.; Prof. Lyle C. Jenness, U. of Maine.

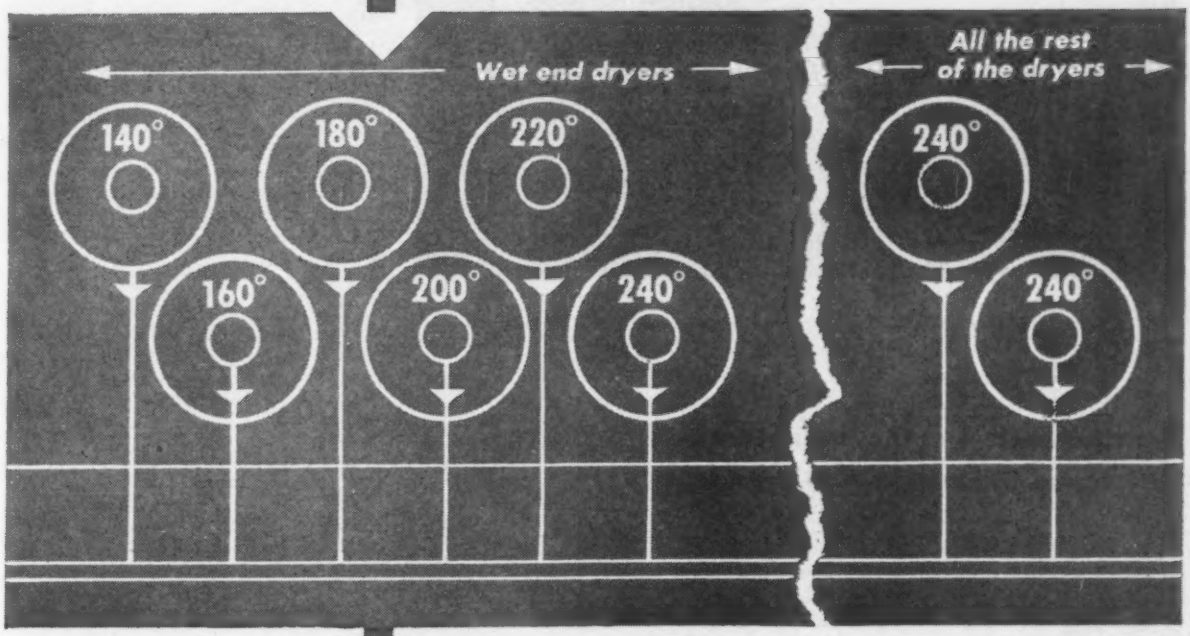
Second row (standing)—R. A. Wilkins, vice pres., Bird & Son, E. Walpole, Mass.; F. A. Soderberg, General Dyestuffs Corp.; P. O. Bolton, Robert Gair Co., Uncasville, Conn.; J. A. Mangan, National Paper Co., Chisholm, Maine; Prof. J. B. Calkin, U. of Maine; Robert W. Ramsdell, Pennick & Ford, New York City.

Packaging Institute Tech. Committees Plan Luncheon

A luncheon meeting of all the technical committees of Packaging Institute has been called for Thursday, April 19; charge for the luncheon, to be held at the Ritz-Carlton Hotel, Atlantic City, N.J., at 12:30 noon, is $3.50. Non-members are invited to attend.

The technical session of the AMA Packaging Conferences will end at noon on the day of the luncheon, permitting those who wish to attend both the AMA and the PI technical meetings to do so without conflict. Those who desire to attend individual committee meetings of the Institute as visitors should obtain permission from the appropriate committee chairman by writing to him in care of the Packaging Institute, 342 Madison Ave., New York 17.

HOW THE ARMSTRONG INDIVIDUAL DRYER TEMPERATURE CONTROL GIVES YOU BETTER DRYING:



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- **Maintains any Temperature from 100° to 250°F**
- **Positive—Dependable—Guaranteed**

ARMSTRONG Individual Dryer Temperature Controls are used to accurately maintain reduced temperatures in the wet end dryers of a paper machine. This keeps the paper from sticking to the surface of the dryer and also prevents cockle. Each dryer is controlled independently of any other dryer and can be regulated at any point from 100° to 250°F. Temperatures below 212°F are secured by controlling a mixture of steam and air in the dryer. Above 212°F, no air is mixed with the steam and control is entirely by steam pressure.

The Armstrong Control is simple, dependable, and guaranteed to give satisfaction. For complete information call your nearby Armstrong Representative.

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WRITE FOR BULLETIN NO. 187 — two-color diagrams and explanation show you how the Control operates to give you accurate dryer temperature control.

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Courtesy Paper & Paper Products

FIRST LIFE MEMBERSHIP of Salesmen's Association is presented to Association's first president, George K. Gibson (left) by retiring president, Dan Keck, at SAPI Annual Luncheon

SAPI presents first life membership to George Gibson, its first president

▶▶▶ A "SELL-OUT" was the term applied to the annual luncheon of the Salesmen's Association of the Paper Industry, which was held February 20 at the Waldorf-Astoria Hotel, New York City. More than 1550 people attended this gala event.

Principal speaker at the luncheon was Kenneth deCourcy, publisher and editor of *Intelligence Digest*. Daniel H. Keck (president of Kimberly-Clark Corp.), president of SAPI, presided at the luncheon, which reached its climax with the presentation of the Association's first life membership.

Following the luncheon, a gold, honorary life membership card was presented by John Johnston (Union Bag & Paper Corp.) chairman of the membership committee, to George K. Gibson, one of the charter members of the Salesmen's Association and its first president. A second honor was conferred upon Mr. Gibson, when President Keck, assisted by George Watson, elected to succeed him; Wm. J. Tilden, re-named as western vice president; and David Cheever, Jr., elected vice president representing the Boston division, presented to Mr. Gibson a special gift, a handsome leather desk set accompanied by a resolution praising his services and loyalty to the Association. Another surprise for Mr. Gibson came when President Keck returned to him a check he had sent to the Association for 1951 dues.

Mr. Gibson's work in the Salesman's Association is well known to the industry. For many years he was sales manager of Mosinee Paper Mills (Mosinee, Wis.) with offices in Chicago. Although he is now living in Florida and retired from active service, he maintains many contacts.

Following the presentation, Mr. Gibson expressed his thanks for the honors awarded him and said: "While I am off the pasturage, I am still an active member and still on the payroll of my company and expect to be 25 years from now."

Agenda of Divisions Superintendents Ass'n

Several groups of The American Pulp and Paper Mill Superintendents Association have made plans for future meetings.

Michigan Division—The April 5th meeting of this Division, originally scheduled for the Columbia Hotel, Kalamazoo, Mich., will be held at the Hotel Harris in Kalamazoo. This meeting will be held co-operatively with the Kalamazoo Valley Section of TAPPI.

Southern and *Southeastern Divisions*—These two Divisions will meet jointly at the George Washington Hotel in Jacksonville, Fla., from October 10-12.

Southeastern Division—The annual Spring Meeting of this group will be held at The Jefferson Hotel, Richmond, Va., May 4 and 5.

Northwestern Division—Plans for plant visits, an industrial program and sports events which will make up the May 4-5 Spring Meeting of this group are now being completed. Room reservations for the Radisson Hotel, Minneapolis, where the meeting will be held, should be secured from Neil Wilsey, Radisson room reservation manager.

Miami Valley Division—A feature of the 1951 Spring Meeting of this Division, scheduled for May 25 at the Orr Felt and Blanket Co. plant at Piqua, Ohio, will be the election of Division officers for the following year.

INDUSTRIAL AFFILIATES representatives for the 1950-51 term have been appointed by several Divisions of the Superintendents Association. Harry Hulmes, Williams-Gray Co., Chicago, has accepted the appointment from the Southeastern Division; C. I. Horton, R. T. Vanderbilt Co., South Norwalk, Conn., will assume the representation for the Connecticut Valley Division; and the Southern Division has chosen George Withan, Mobile, Ala., as its representative.

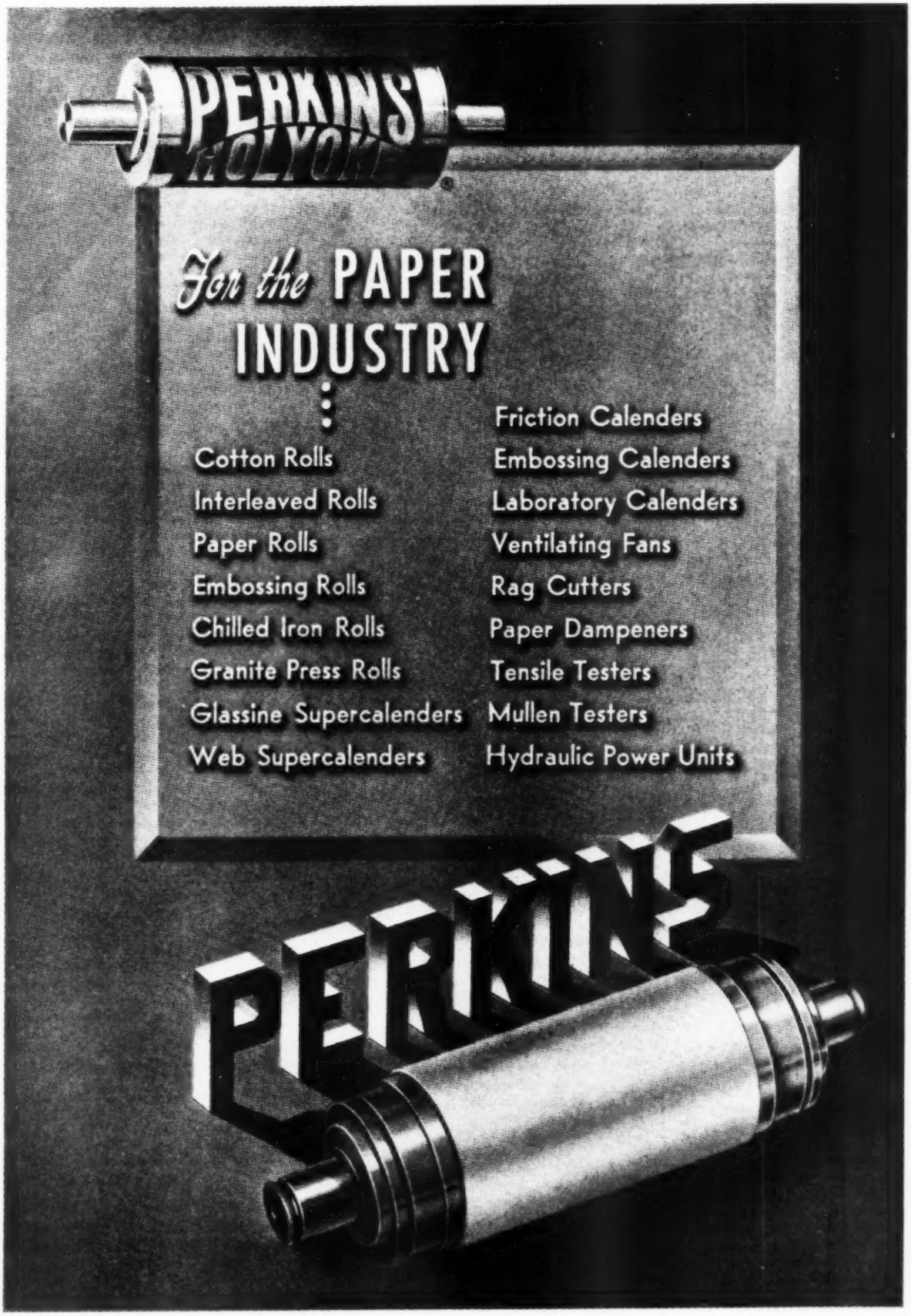
ELECTION OF OFFICERS of the Wisconsin Paper group have resulted in Nathan H. Bergstrom, president of Bergstrom Paper Co., Neenah, Wis., being elected president of the group. Other officers elected include David Smith, Wausau Paper Mills, vice president; and Leo O. Shubart, Neenah Paper Co., secretary-treasurer. Reelected to the executive committee were: W. K. Gerbrick, Central Paper Co., Menasha, Wis.; Douglas G. Hyde, Marathon Corp.; O. W. Johnson, Rhinelander Paper Co.; G. E. McCorison, Thilmany Pulp and Paper Co., Kaukauna, Wis.; A. C. Remley, Nekoosa-Edwards Paper Co., Port Edwards, Wis.; L. R. Watson, Tuttle Press, Appleton, Wis.; and W. L. Thornton, Jr., Kimberly-Clark Corp.

Two New Chapters Formed by Engineers Society

Formation of two new chapters has been announced by The Society of Industrial Packaging and Materials Handling Engineers. The newly formed Indianapolis, Ind., group has chosen the following officers: E. E. Clemons, traffic manager of Schwitzer Cummins Co., president; E. M. Richardson, Kingan & Co., vice president; O. L. Vickers, Rough Notes Co., secretary; and J. C. Heim, J. C. Heim and Associates, treasurer.

At a new Philadelphia chapter these officers were elected: Herbert M. Lapidus, Navy Department Aviation Supply Depot, president; F. Robert Campbell, Armstrong Cork Co., executive vice president; A. O. Manger, Rathborne, Hair & Ridgway Co., vice president, packaging; H. T. French, Electric Storage Battery Co., vice president, materials handling; R. F. Tettemer, H. G. Hanline Co., secretary; and B. J. Brooks, Jr., North American Companies, treasurer.

IN CONJUNCTION WITH THE SEVENTH annual meeting of the Metal Powder Association, the 1951 Metal Powder Show will be held at Hotel Cleveland, Cleveland, Ohio, April 25-26, 1951. Additional information about the exhibit and technical program may be received from Metal Powder Association, 420 Lexington Ave., New York 17.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Divisional Group Meetings

Writing Paper Manufacturers Assn.

At the 90th annual meeting of the Writing Paper Manufacturers Association, W. B. Zimmerman, president, stated that in the period ahead "we have a real opportunity to benefit from our Association—and that the Association has tremendous opportunities for service to the members and the public." Mr. Zimmerman, vice president of The Howard Paper Mills, Inc., Dayton, Ohio, is retiring president of the Association.

Bruce Crane, Crane and Co., Inc., Dalton, Mass., was elected president of the Writing Paper Manufacturers Association at its 90th Annual Meeting at the Waldorf-Astoria, Tuesday, February 20, 1951. Crane and Co., Inc., papermakers for 150 years, manufacture the currency paper for the U.S. Government.

A. C. Remley, Nekoosa-Edwards Paper Co., was re-elected vice president, and George Williamson, Strathmore Paper Co., was elected as vice president.

H. V. Burgee was re-elected alternate representative of the Association on the Board of Governors of the American Paper and Pulp Association.

M. C. Dobrow was re-elected executive secretary-treasurer. This marks 35 years of service by Mr. Dobrow with the Writing Paper Manufacturers Association. John F. Darrow was re-elected assistant secretary and Miss Olive F. McGill was re-elected assistant treasurer.

Members elected to the Association Executive Committee representing the Rag Content Paper Group were: George Williamson, Strathmore Paper Co., elected chairman of the Rag Content Paper Group; M. D. Bardeen, Lee Paper Co.; D. K. Brown, Neenah Paper Co.; T. M. Gilbert, Gilbert Paper Co.; Hale Holden, Byron Weston Co.; F. E. May, Rising Paper Co.; E. C. Reid, American Writing Paper Corp.; A. J. Schierl, Writing-Plover Paper Co.; William Whiting, Whiting Paper Co. Members elected to the Association Executive Committee representing the Sulphite Bond Group were: A. C. Remley, Nekoosa-Edwards Paper Co., re-elected chairman of the Sulphite Bond Group; W. J. Garrity, Munising Paper Co.; J. H. Goodwin, International Paper Co.; H. H. Hanson, W. C. Hamilton & Sons; W. L. Jennings, West Virginia Pulp and Paper Co.; H. W. Kampf, Mead Corp.; C. B. Morgan, Eastern Corp.; H. W. Suter, Jr., Champion Paper & Fibre Co.; J. D. Zink, Hammermill Paper Co.

In addition, the following were re-elected to the Association Executive Committee: Norman Harrower, Linton Brothers & Co., representative of the Bristol Board Group; G. E. O'Connor, Mohawk Paper Mills, Inc., representative of the Cover and Text Paper Group; Bernard Lucas, S. D. Warren Co., representative of the Thin Paper Group.

Speakers at the meeting included General Frank Howley, former Commander of the U.S. Zone in Berlin; W. B. Zimmerman, president of the Association; R. E. O'Connor, American Paper and Pulp Association; W. W. Corlett, counsel, and M. C. Dobrow, executive secretary of the Association.

Norman Harrower, Linton Brothers & Company, Fitchburg, Mass., was re-elected chairman of the Bristol Board Group of the Writing Paper Manufacturers Association at its meeting at the Waldorf-Astoria, New York City, February 19.

Other members of the Bristol Committee re-elected were: A. P. Mitchell, vice chairman, Riegel Paper Corp.; J. B. Cowie, Hollingsworth & Whitney Co.; R. H. Morrill, Chemical Paper Manufacturing Co.; George Watson, Wheelwright Papers, Inc.

Bernard Lucas, S. D. Warren Co., Gardiner, Maine, was re-elected chairman of the Thin Paper Group of the Writing Paper Manufacturers Association at its meeting at the Waldorf-Astoria, New York City, February 22.

The Thin Paper Group is composed of paper manufacturers who make carbonizing and condenser tissue, cigarette paper and other high-grade thin papers.

The speakers at the Thin Paper Group Meeting were W. L. Neubrech, deputy director of Pulp and Paper Division, National Production Authority; Col. Robert Hamilton, New York Purchasing Office of the Quartermaster General and M. C. Dobrow, executive secretary of the Association.

George E. O'Connor, Mohawk Paper Mills, Inc., was re-elected chairman of the Cover and Text Paper Group of the Writing Paper Manufacturers Association at its meeting at the Waldorf-Astoria on February 21.

Other members of the Cover and Text Paper Committee elected were as follows: C. W. Hanson, Hampden Glazed Paper and Card Co., as vice chairman of the Committee; R. F. Arnold, Strathmore Paper Co.; G. H. Beckett, Beckett Paper Co.; L. B. Kelley, A. M. Collins Manufacturing Co.; W. W. Langtry, District of Columbia Paper Mills, Inc.

J. L. Ritchie, executive director, U.S. Pulp Producers Association, discussed the wood pulp supply situation. Mr. Ritchie said in part:

The supply of wood pulp available for domestic consumption in 1950 was the highest on record.

This country's aggregate new supply of wood pulp last year totaled over 17 million tons, exceeding the 1949 new supply by 24% and the 1948 supply by 14%.

The new supply of market pulp also established an all-time record in 1950. Market pulp supply last year totaled 3,424,000 tons, exceeding the 1949 new supply by 37% and the 1948 supply by 9%.

Expansion of domestic pulp capacity during the postwar period 1946-50 averaged over a million tons a year.

As a result of increased capacity and high operating rates, total domestic pulp production in 1950 broke all records. Production for the year totaled 14,827,000 tons exceeding 1949 production by 22% and 1948 production by 15%.

Domestic sales of market pulp were at a peace time high in 1950. Last year's domestic sales of market pulp totaled 1,543,000 tons, exceeding 1949 sales by 26% and 1948 sales by 9%. Domestic sales in 1950 constituted 45% of our total market pulp supply.

The supply of domestic pulp that will be potentially available for domestic consumption in 1951 will depend upon a number of factors, some economic, some political. The level of domestic capacity will continue to rise in 1951. Whether or not overall demand will require full utilization of an expanded pulp capacity throughout 1951 is a moot question. If it does not, then the level of demand will be a primary factor in the determination of the level of pulp supply. If it does, then the impact of other factors upon the domestic industry's 1951 operating rate will have a major bearing on the supply of pulp prospectively available for normal United States consumption this year—for example, the impact of possible shortages of materials, such as sulphur or wood, and of services, such as transportation and manpower; or the impact of increased demands for nitration or for export under the government's mobilization program.

The supply of wood pulp from Canada and the United States, potentially, could be greater in 1951 than in 1950; many bottlenecks could arise in both countries, however, to prevent full operation of existing facilities and full achievement of maximum potentialities.

Some decline in the volume of overseas' imports seems indicated for 1951; the measure of the decline may be determined in part by the character of our domestic controls.

If the full potentialities of North American supply can be realized and if the prospective decline in imports from overseas can be minimized, then there is a good prospect that this country's total supply of pulp in 1951 may exceed that of 1950.

Coated and Processed Paper Assn.

At the annual meeting of the Coated and Processed Paper Association, held at the Hotel Commodore on February 19, Spurgeon F. Brandt of the Wyomissing Glazed Paper Co., Reading, Pa., was elected to a second term as president. Vice president elected for the Manufacturing Division is F. Allan Barr, Holyoke Card & Paper Co., Springfield, Mass.; and for the Merchandising Division, Bernard B. Novasel, Lachman-Novasel Paper Corp., New York. The following Executive Committee was named: Lawrence R. Clark, Hampden Glazed Paper & Card Co., Holyoke; Leo R. McDevitt, Blackstone Glazed Paper Co., Pawtucket, R.I.; Keho E. Tozier, K. E. Tozier Co., Boston, and Charles H. Hoffman, Hughes and Hoffman, New York.

Kraft Paper Assn.

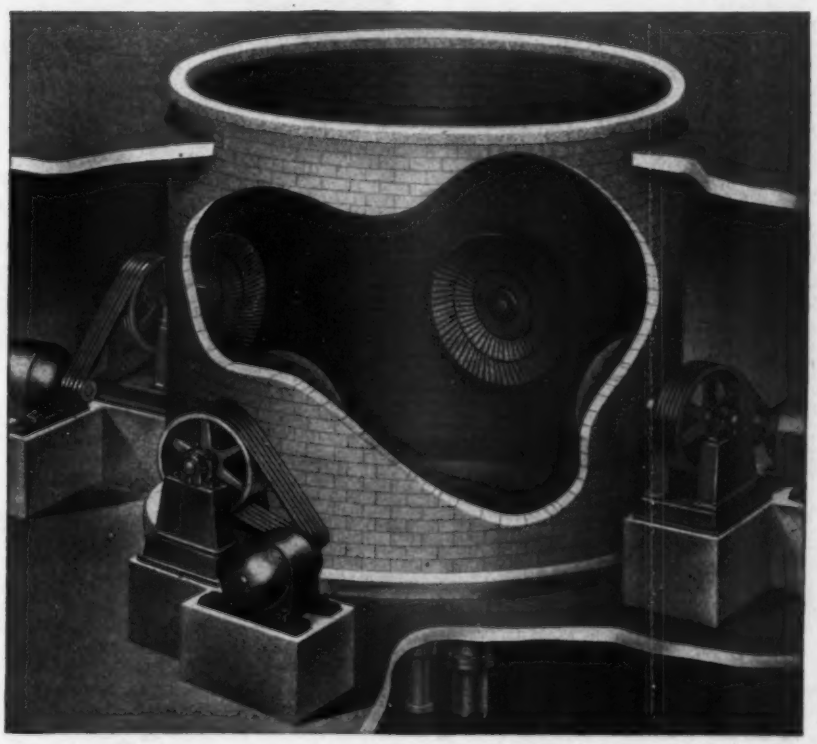
Wayne A. Brown of the Crown Zellerbach Corp., was elected President and Walter G. Shorter of the Camp Manufacturing Co., was elected vice president at

The Rice Barton QuatroPulper

. . . a high production machine . . . ideal for disintegrating pulp, broke or waste paper

Other DynoMachines:

- The **QuatroPulper** is designed for processing stock in large capacities . . . either batch or continuous operation.
- The **DynoChest** is primarily for disintegrating stock in slush form . . . batch operation.
- The **DynoFiner** is for performing the same operation on a continuous basis.



THE stock is charged all at one time into the top of the vat. Four DynoPellers (described below) subject it to the vigorous dynomizing action that completely separates each fibre from its neighbor, maintaining its original length. The simple operating principle and design of the QuatroPulper eliminates the "wracking" and grief of other types of pulpers. Because there are few moving parts there is no loss of production time due to repair or adjustment. The QuatroPulper defibers the stock at low cost and produces a high quality slurry quickly and effectively.

Let us tell you how the QuatroPulper can save YOU money in processing YOUR particular stock. Write today.

RBR8

The DynoPeller ·····▸
Is the heart of all DynoMachines. Its concave face is lined with rough, hard carbide particles. As the DynoPeller rotates it causes a suction at its center that pulls the stock towards it. Centrifugal force then causes the stock to flow rapidly over the rough carbide particles. This effective dynomizing action completely disintegrates the stock . . . separating each fibre from its neighbor while maintaining its original length.

RICE BARTON Research Corporation
WORCESTER 1, MASS.

the Annual Meeting of the Kraft Paper Association, Inc., held at the Waldorf-Astoria Hotel on February 21st. The following were elected to serve on the Executive Committee of the Association for the current year: W. M. Allin, Southern Advance Bag & Paper Co., W. A. Brown, Crown Zellerbach Corp., J. B. Cowie, Hollingsworth & Whitney Co., H. S. Daniels, Union Bag & Paper Corp., W. J. Dixon, St. Regis Paper Co., K. O. Elderkin, Crossett Paper Mills, S. D. Fleet, Albemarle Paper Manufacturing Co., L. W. Gould, Gaylord Container Corp., G. F. Henderson, Brown Co., W. L. Jennings, West Virginia Pulp and Paper Co., H. C. Lawless, Union Bag & Paper Co., William Mazer, Hudson Pulp & Paper Co., R. A. Nash, Sorg Paper Co., W. C. Shorter, Camp Manufacturing Co., and George Stuhr, Southern Kraft Division of the International Paper Co.

U. S. Pulp Producers Association

The United States Pulp Producers Association held its annual meeting on February 19 and re-elected its executive director, James L. Ritchie. Regional directors elected are: New England—Downing P. Brown, Brown & Co.; Middle Atlantic—H. S. Oliver, New York & Pennsylvania Co.; South—Stuart E. Kay, International Paper Co.; Lake States—W. M. Wright, Kimberly-Clark Corp., and West Coast—L. K. Larsen, Weyerhaeuser Timber Co. These officers will serve on the executive board, which also includes the following directors at large: R. M. Buckley, Soundview Pulp Co.; C. H. Conrad, Rayonier, Inc.; Stuart B. Copeland, Northwest Paper Co.; Willard J. Dixon, St. Regis Paper Co.; Amor Hollingsworth, Penobscot Chemical Fiber Co.; James L. Knipe, Union Bag & Paper Corp.; James L. Madden, Hollingsworth & Whitney Co.; Reuben B. Robertson, Jr., Champion Paper & Fibre Co.; Lawson Turcotte, Puget Sound Pulp & Timber Co., and Joseph M. Wafer, West Virginia Pulp & Paper Co.

Groundwood Paper Manufacturers Assn.

The Groundwood Paper Manufacturers Association re-elected its president, E. J. Doonan of Gould Paper Co., Lyons Falls, N.Y., at its annual meeting on February 20. Robert Faegre, Minnesota & Ontario Paper Co., Minneapolis, was elected Eastern vice president, and E. G. Murray, St. Regis Paper Co., New York, was chosen Western vice president. The board of governors includes the foregoing officers and J. G. Conley, Fraser Paper, Ltd., New York; George H. Fay, Mead Corp.; and P. A. Mahoney, International Paper Co., New York. Robert E. Canfield of Wise, Corlett & Canfield has been named secretary and treasurer for another year.

Waxed Paper Institute

B. F. Lacy, vice president of Pollack Paper Corp., was reelected as chairman of the executive committee of the Institute at its annual meeting held at the Waldorf-Astoria hotel February 21. Newly elected to the executive committee was Donald Ramsay, vice president, Nashua Gummed & Coated Paper Co.; John H. Snyder, Marathon Corp., was reelected promotion manager for the baking industry and D. J. Benjamin, president of Waxide Paper Co., was retained on the committee as well. Other members of the executive committee who are continuing in office include G. C. Wieman, manager, Western Wax Paper Co.; J. E. Edelstein, vice president, Rapinwax Paper Co.; C. F. Christy, vice president and sales manager, Kalamazoo Vegetable Parchment Co.; H. K. Snyder, president, Central Waxed Paper Co.; and K. R. Zimmer, president, Zimmer Paper Co.

A. H. Noelke continues as secretary-treasurer of the Institute. He announced new members of the Institute at the meeting, and gave his annual report. The new chairman, Mr. Lacy, discussed "The State of the Industry," and the Institute's Washington counsel, George P. Lamb, reported on the relations of the waxed paper industry with the Government agencies involved in the war mobilization program. Dean Bowman, National Production Authority, was another featured speaker.

T. H. Osborne, assistant sales manager of Waxide Paper Co., and head of the Institute's merchanting committee, reviewed a proposed national mechandising campaign displayed at the meeting; C. E. Rogers, the Institute's marketing director, and N. W. Postweller, packaging engineer for National Biscuit Co., also spoke concerning the campaign.

Paper Napkin Association, Inc.

This group held its annual meeting and election of officers on February 20 in the Hamilton Room of the Barclay Hotel, choosing B. T. Hoffmaster, Hoffmaster Paper Co., Oshkosh, Wis., as its chairman. Mr. Hoffmaster succeeds C. E. O'Connor, Jr., Diamond Match Co., in the position.

Vice chairmen chosen include Norman

(Turn to page 1320)

GROUP AT MICHIGAN DIV. SUPERINTENDENTS meeting: Left to right—R. H. Peeters, St. Regis Paper Co.; Edward O. Evans, Acme Steel Co.; John C. Wood, Kalamazoo Vegetable Parchment Co.; Dr. A. H. Nadelman, Western Michigan College; John S. Kay, Rhinelander Paper Co.; Leonard Parkinson, Rhinelander Paper Co.

Michigan Superintendents Learn "What's New" in Finishing Rooms

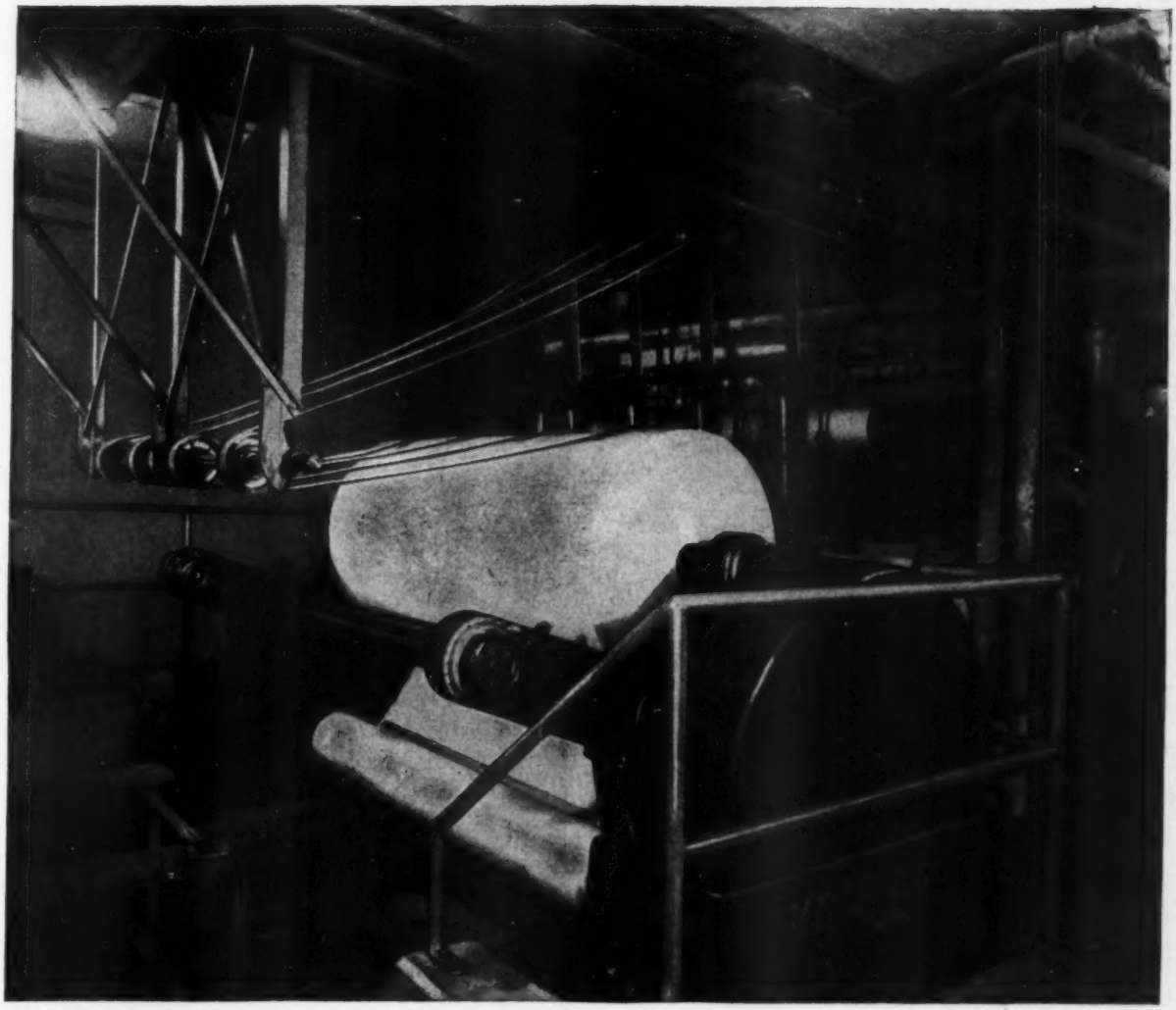
▶▶▶ Guest speaker at the February meeting of the Michigan Division of the Superintendents Association was Leonard Parkinson, superintendent, Rhinelander Paper Co., Rhinelander, Wis. The meeting was held at Hotel Harris in Kalamazoo the evening of February 15.

Mr. Parkinson gave a description of the finishing room at the Rhinelander plant, which is one of the newest finishing rooms in the Middle West. He said that the walls of the room are of white tile; that the floor area of the room is 160 ft. by 120 ft.; that there is room for 10 railway cars under cover in the department at the shipping end. He also commented that nearly half of the room is given over to sheet production although this production amounts to only about 20 per cent of the whole. Stress also was placed on the equipment employed for the handling of rolls.

Mr. Parkinson was assisted in the discussion and also in showing pictures of the room by John S. Kay. Mr. Kay is efficiency engineer at Rhinelander. It is his responsibility to minimize waste in the mill—considerable savings having been effected by checking back on all waste and on the source of supply in the broke boxes.

Another feature of this program was the showing of two films—one covering practices in the finishing room of the Champion Paper and Fibre Co. of Hamilton, O.; the other revealing shipping techniques employed by five Southern textile mills. These films were shown by Edward Evans, Acme Steel Co., Chicago, Ill.

O. W. Callighan, Chairman of the Division, presided at the meeting. Speakers were introduced by Dr. Alfred H. Nadelman of Western Michigan College (Kalamazoo), who also served as moderator of a panel discussion. Sitting on the panel were: H. B. Johnston, plant engineer, Allied Paper Mills; Richard H. Peeters, finishing superintendent, Bryant Division, St. Regis Paper Co.; and John C. Wood, vice president in charge of manufacturing, Kalamazoo Vegetable Parchment Co.



Above—KOHLER MAGAZINE REELS AND ELECTRICALLY-OPERATED ROLL STANDS (FLYING PASTER) IN BIG CONVERTING PLANT.

Arm for Action...

If it's better wound rolls—if it's continuous unwinding and winding of rolls on the fly—if it's web control—if it's reduction of waste—if it's any of these things, a *Kohler System* will arm the converter for action.

Kohler high-speed roll-handling equipment also "pays off" in the paper mill—at the finishing end, on super calenders, on coaters.

Contact Dilts at Fulton.

KOHLER SYSTEM EQUIPMENT

PRODUCT OF

Dilts MACHINE WORKS, FULTON, NEW YORK

SHARTLE BROTHERS MACHINE CO., MIDDLETOWN, OHIO
DIVISIONS OF THE BLACK-CLAWSON COMPANY, HAMILTON, OHIO
Western Sales Office: Mayer Building, Portland, Oregon
Associate: ALEXANDER FLECK LIMITED, Ottawa, Canada
Subsidiary: B-C INTERNATIONAL, LTD., 16 Catherine Place, Victoria, London S.W.1, England

CPPA and its Tech. Section Hold Annual Meetings

▶▶▶ THE ANNUAL meeting of the Canadian Pulp and Paper Association convened at the Mount Royal Hotel, Montreal, Canada, January 24-26. More than 1500 executives gathered for this, the 38th annual CPPA meeting.

Harold S. Foley, 1950 chairman of the Association's executive board and president of Powell River Co., Vancouver, B.C., was chairman of the meeting, and presided over the meeting of the Association council. Mr. Foley, now retiring as CPPA chairman, was given a special award and citation for his outstanding work as the Association's chief officer during the past two years. Douglas White Ambridge, president and general manager of Abitibi Power and Paper Co., Ltd., Toronto, Ont., was chosen chairman of the executive board for 1951.

Pres. Fowler addresses Association on "Problems"

The Association's president, R. M. Fowler, spoke on Problems and Responsibilities in 1951 at the Association's annual luncheon, held January 26. Giving a concise record of 1950 production, Mr. Fowler stated that totals of all commodities—newsprint, plups, paperboard and all types of papers—exceeded 1949 production by half a million tons. A gross production value of more than $900,000,000 was responsible for more national wealth than any other single element of the Canadian economy.

Although the industry has been operating at full capacity in Canada, Mr. Fowler warned there are going to be future production problems. He said, "It will be difficult to continue to expand production as has been done in the last five years, and it may even be hard to maintain production totals at 1950 levels. Some of these problems of 1951 are already apparent." Stressing that "so long as full scale war has not broken out, we enter an open-ended situation," he concluded that an instinctive turn to government controls combined with an overly-cautious attempt for survival may be an almost certain way not to survive, and suggested that we not "let the dangers of the immediate present make us lose our perspective."

Technical section hears many valuable papers

An outstanding part of this year's convention was the program of the Technical Section, which met for its 37th annual gathering. E. G. Kirby, assistant manager of Price and Pierce Ltd., Montreal, was chairman of the program. As did chairmen of the various other Sections, Mr. Kirby presented a summary of his Section's 1950 activities. Displays of equipment and processes illustrated most modern methods. Presentation of technical papers, prepared by well-known Canadian and U.S. paper industry authorities, was the main part of the Section's program.

W. W. Holland
New Chairman, Tech. Sec. Exec. Council

E. G. Kirby
Retiring Chairman Tech. Sec. Council

Douglas W. Ambridge
Chairman Executive Board, CPPA

Douglas Jones
Exec. Sec'y of Can. Tech. Section

Dr. Thiesmeyer speaker at luncheon—new officers chosen

At the annual business luncheon of the Technical Section, the following men were chosen as the Section's 1951 executive council:

Chairman—W. W. Holland, general superintendent, Quebec North Shore Paper Co., Baie Comeau, Quebec.

Vice Chairman—H. C. Lee, Assistant Chief engineer, Canadian International Paper Co., Montreal.

Councillors—T. R. Moore, mill manager, Anglo-Newfoundland Development Co. Ltd., Grand Falls, Newfoundland; J. A. Hanna, mill manager, Bathurst Power and Paper Co. Ltd., Bathurst, N.B.; R. L. Fraser, assistant manager, Ste. Anne Paper Co. Ltd., Beaupre, P.Q.; Dr. W. Gallay, director of research, The E. B. Eddy Co., Hull, P.Q.; and J. R. W. Grieve, superintendent, Brown Corp., La Tuque, P.Q.

Another feature of the luncheon was a talk on recent achievements of the Pulp and Paper Research Institute of Canada given by Dr. Lincoln R. Thiesmeyer, Institute president. Dr. Thiesmeyer stressed the establishment of methods for co-operative contract research as the most significant move made by the Institute. "We are writing contracts," he said, "with companies, groups of companies, associations or individuals in this industry and allied industry to do specified work of either research or service nature the cost to be borne entirely by the requestor. In this way we make the Institute in effect an extension of his own organization for that particular work."

Dr. Thiesmeyer commented that this kind of operation has great appeal to the industry because it puts relationship with the Institute on the basis of payment for services rendered by those who receive them, rather than payment of a contribution to a worthy cause. The research contract effort, which went into operation only last July, is now a project of nearly $250,000.

Thus far, the most important contract job undertaken is a two-year intensive study being made for twelve paper mills throughout Canada. The mills, all of which produce alkaline pulp, have financed a study of the cause of corrosion in all types of equipment to the stage of slush pulp. This research project is being conducted in liaison with similar studies in the United States, Scandinavia, and Australia.

Future plans of the Institute, said Dr. Thiesmeyer, include student training and placement in industry.

Presentation of Awards

Awards and prizes given regularly by the Section were presented at the luncheon. These awards, and their winners, included:

I. H. Weldon Gold Medal, given to the authors of the best paper read at the 1950 meeting, Dr. J. Keith Russell, research chemist, and David Craig, research engineer, Anglo-Canadian Pulp and Paper Mills Ltd., and associated firms, for their presentation of a method of using waste sulphite liquor.

Technical Section Service Award, presented to the Section member who has contributed the most toward the Section's aims and objectives during the past year, was awarded to Dr. Wilfred Galley, director of research, E. B. Eddy Co., Hull, Quebec, chairman of the Section's fundamental research committee for the past three years.

C. Howard Smith gold medal, presented annually to the junior or student Section member who submits the best paper during the year on one of a specified series of subjects relative to current industry problems, was given to D. B. Scrivens, formerly instrument engineer, Spruce Falls Power and Paper Co., Kapuskasing, Ont., and now associated with Taylor Instrument Cos., Rochester, N.Y.

Safest Mill in Canada Contest shields were presented to Ste. Anne Paper Co., Beaupre, Que., as winner of the Class A contest, and to Kimberly-Clark Corp. of Canada, Ltd., Kapuskasing, Ont., as winner of the Class B contest.

Gadget Competition $50 first prize was awarded P. X. Laberg, plant engineer,

Gee, Mr. Smith... you say the funniest things!

Sec: I never worked for a paper mill before. You use the funniest words! "Railroading!" "Crush!" What do they mean?

Sup: They mean trouble . . . and plenty of it! When the nip squeezes water from a sheet faster than the felt can take it, the water "railroads" back toward the wet end until there's so much water trapped between the felt and the sheet that it "crushes" through the sheet.

Sec: Then "railroading" means water traveling back along the felt . . . and "crush" means bursting through the paper. Right?

Sup: Young lady, you've said it! And we lick "railroading" and "crush" by using the proper weave and weight of felt for the job.

Sec: How can you be sure it's the proper weave and weight?

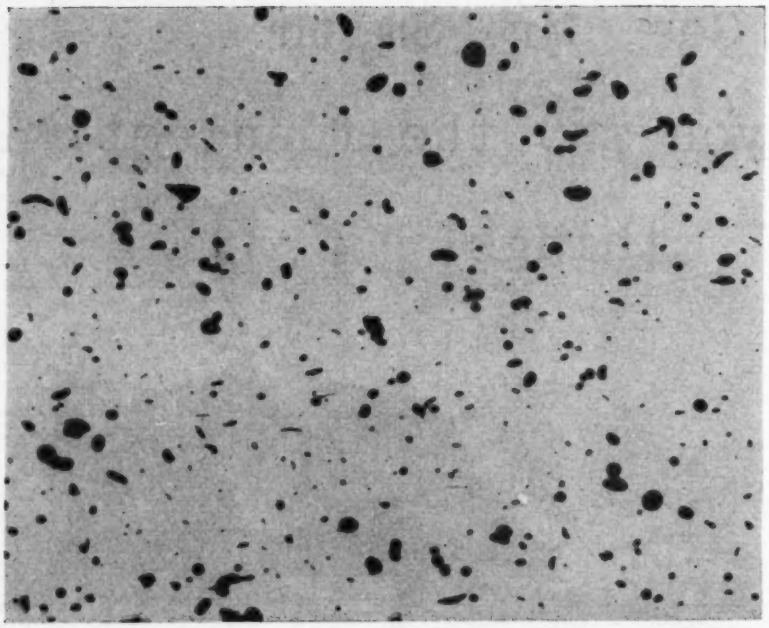
Sup: By making the Hamilton Felt Man responsible for selecting the right felt for the work we're doing at the speed we need to get.

Hamilton Felts

MIAMI WOOLEN MILLS

Established 1858

SHULER & BENNINGHOFEN, HAMILTON, OHIO



A self portrait of newsprint containing radioactive fibers (shown as the black spots) made by placing the paper in contact with an X-ray film. This "radiautograph" was made from newsprint recently turned out on the world's fastest newsprint machine (at the Quebec North Shore Paper Co. mill at Baie Comeau, Que.) in an experiment conducted by research scientists of the company and of the Pulp and Paper Research Institute of Canada, Montreal. For every radioactive fiber shown here, there are about 1,000 inactive fibers. The irregular shape in some cases is due to irregularities in the shapes of the fibers themselves, and in other cases due to "fogging" by overexposure.

Donohue Bros. Ltd., La Malbaie, P.Q., for his idea on a wood counter for hydraulic type grinders. Joint winners of the $25 second prize were F. Lindberg, assistant master mechanic, and H. Fisk, machine shop foreman, The Great Lakes Paper Co., Fort William, Ont., for their portable machine which hones and polishes calender stack base rolls.

Some papers reveal phenomenal discoveries

Some 32 papers were read at the Technical Section meetings, while the Section participated in 18 group discussions on many phases of pulp and paper manufacture. One paper, entitled "The Application of Radioactive Tracers to Measurement of Fiber Flow and Distribution," revealed details of a full-scale industrial experiment with pulp fibers made radioactive. Dr. C. A. Sankey, research director, The Ontario Paper Co., Thorold, Ont.; Dr. S. G. Mason and Dr. G. A. Allen, physical chemistry group, Pulp and Paper Research Institute of Canada; and W. R. Keating, control superintendent, Quebec North Shore Paper Co., Baie Comeau, Que., reported in this paper on the experiments made at the Quebec North Shore mill.

Radioactivity was in this test used for the first time in Canada in production operation during a normal production period. Before the test was attempted, a mill scale experiment was planned by the Institute, where a method previously developed to make wood fibers radioactive had been carried out in pilot plant tests.

Small groups of fibers were traced through various stages of the papermaking process when minute amounts of radioactive iodine, discernible with a Geiger counter, were added to the pulp fibers. This testing process, proven to be in no way dangerous to those working with it, should allow many studies heretofore impossible to be carried out on a mill scale.

Divisional Group Meetings

(Continued from page 1316)

Eber, Winchester Paper Co., Ashuelot, N. H., Eastern section; and Elmer R. Krueger, Paper Art Co., Indianapolis, Western section. Members at large are R. W. Bertram, Marathon Corp., Menasha, Wis.; R. L. Fenstamaker, C. A. Reed Co., Williamsport, Pa.; John B. Kohl, Hoberg Paper Mills, Green Bay, Wis.; L. W. Moore, Crown Zellerbach Corp., San Francisco; and J. F. Meyer, Groff Paper Co., St. Paul, Minn. Arlo Wilson was re-elected as secretary-treasurer.

At the luncheon following the business meeting at the Barclay, several addresses were given. George P. Lamb, Association counsel, discussed Washington affairs, and the guest speaker, Leigh R. Sanford, president of the Ship Builders Association of America, discussed the importance of trade membership.

The Association's new chairman, Mr. Hoffmaster, is the group's representative to the APPA; W. F. Erisman, Erving Paper Mills, Erving, Mass., is alternate.

Five new member firms were announced at the meeting, in addition to five revealed earlier in the year. These are Crown Zellerbach Corp., San Francisco; Protecto Products Co., Pomona, Cal.; Consolidated Paper Manufacturing Co., Los Angeles; Green View Tissue Mills, New York; and Freeman Paper Co., Green Bay, Wis.

Sulphite Paper Manufacturers Assn.

Eleven executive members of the Sulphite Paper Manufacturers Association were re-elected at the annual meeting held at the Waldorf-Astoria on February 19. James G. Conley, Fraser Paper, Ltd., New York, is general chairman for another term. Divisional vice chairmen are: *Bleached group*—Leo E. Croy, Marathon Corp., Menasha, Wis.; *Unbleached group*—George Stuhr, Southern Kraft Div.; *Manila group*—Donald F. McCall, Racquette River Paper Co., New York; *Machine Glazed group*—Neil E. Nash, Nekoosa-Edwards Paper Co., Port Edwards, Wis.; *Bleached Converting group*—Gilford F. Henderson, Brown Co., New York.

These men will serve on the board of governors, along with Wayne A. Brown, Crown-Zellerbach Corp., New York; Allan G. Hendry, Consolidated Water Power & Paper Co., Chicago; B. W. McEachern, Northwest Paper Co., Cloquet, Minn.; A. P. Mitchell, Riegel Paper Corp., New York, and Alfred Southon, Kalamazoo Vegetable Parchment Co., Kalamazoo.

At the meeting, Thomas J. Burke, secretary-treasurer, submitted his annual report, including an outline of requirements under NPA Order M-36, described elsewhere in this issue.

Glassine and Greaseproof Manufacturers Assn.

The annual meeting of the Glassine and Greaseproof Association held February 21 at the Waldorf hotel saw Robert F. Nelson, vice president of Rhinelander Paper Co., Rhinelander, Wis., reelected president of the group. Also reelected was the Association's executive committee, comprised of: Mr. Nelson; Folke Becker, president, Rhinelander Paper Co.; Elmer H. Jennings, president, Thilmany Pulp and Paper Co.; Paul F. Moore, president and general manager, Westfield River Paper Co.; John L. Riegel, president, Riegel Paper Corp.; and Arthur Schwab, general manager, Hamersley Manufacturing Co. W. W. Corlett, Wise, Corlett and Canfield, law firm, was appointed the Association's counsel; Thomas J. Burke was reappointed as secretary-treasurer.

Business presented at the meeting included discussion of the special booth the Association has arranged for exhibition at the National Packaging Exposition, to be held in Atlantic City from April 17-20 under the auspices of American Management Association. This meeting also revealed that the Association will publish a new booklet on the glassine and greaseproof industry. This publication, which will describe the industry's products, will be available in about three months.

Reports were heard from the technical committee's chairman, S. C. Fairbanks, technical director, Hamersley Manufacturing Co., and from Paul E. Hodgdon, president, Deerfield Glassine Co., chairman of the nominating committee.

The MORDEN Slush-Maker PULPER

...for even those TOUGH PULPING PROBLEMS

- For PULPING
- For BREAKING
- For MIXING
- PRELIMINARY TREATMENT

The *Slush-Maker* pulper quickly and efficiently gives the initial disintegration to all pulps, brokes, or waste papers. In addition, through a hand-wheel controlled bar to bar setting, difficult flakes and bundles are readily brushed out of the stock, color and other additives mixed and brushed in, furnishes blended and, if desired, given a preliminary beating treatment, either on a continuous or batch basis.

The *Slush-Maker* completely defibers high wet strength papers, even in cold water, without damaging the fiber.

MADE BY THE MANUFACTURERS OF THE MORDEN "STOCK-MAKER"

MORDEN MACHINES COMPANY

PACIFIC BUILDING, PORTLAND 4, OREGON

APPLETON FELTS

FOR DESIGN & FINISH

FOR UNIFORMITY

FOR DEPENDABILITY

FOR SERVICE

APPLETON WOOLEN MILLS

APPLETON WISCONSIN

The Paper Industry Names in the News

Southon Becomes KVP President

Former executive vice president, Alfred Southon, was elected to the presidency of the Kalamazoo Vegetable Parchment Co., at the regular meeting of the company's board of directors held February 16. Mr. Southon succeeds the late Ralph Hayward (Cf. P.I. Feb., 1951, p. 1194). He had been named general manager at the board's previous meeting.

Other officers named by the board, all re-elected, include John C. Wood, vice president in charge of manufacturing; C. F. Christy, vice president in charge of sales; J. B. Kindleberger, vice president in charge of market and consumer research; Chas. S. Campbell, treasurer; T. W. Peck, secretary and ass't treasurer; and Wm. R. Hess, ass't secretary.

Mr. Southon first came with KVP in 1912, when the company was only two years old. Hired by the late Jacob ("Uncle Jake") Kindleberger as a sort of "handy man for anything there is to do," he did just that for some years, finding it involved everything from keeping books to pushing trucks, loading and unloading cars, and the thousand other things incident to getting a struggling little converting plant on its feet.

Eventually he worked into production scheduling, then into sales, and in 1924 became general sales manager. In 1936 he was elected to the office of vice president and to the board of directors. In 1947, he became executive vice president.

He was born in London, England, made his way to Canada, worked for two years as a farm hand on a tobacco farm, experienced a crop failure, and on hearing of the possibility of a job in Kalamazoo, landed in town early one morning, walked the three miles to the KVP plant, and was promptly hired. At the time of hiring, Mr. Kindleberger, later noted for his wide use of pertinent mottoes, pointed to one on the wall which read, "You are expected to make good, not to make excuses." It made a lasting impression on the youth, and the same motto, somewhat battered, still hangs on the wall of his office. Mr. Southon is familiarly known as "Doc." He was given this nickname by Uncle Jake Kindleberger the first day he started work with the company—he has been known by it since then.

As president of KVP, Mr. Southon also will head the company's extensive interests in the U.S. and Canada, including The KVP Company Limited at Espanola, Ontario; Appleford Paper Products Limited, at Hamilton, Ontario and Montreal, Quebec; the KVP Company of Texas, at Houston; the KVP branch plant at Devon, Pa.; and the Harvey Paper Products Co., at Sturgis, Mich.

Mr. Southon takes an active part in the paper industry's national associations; he is now a member of the board of governors of the Sulphite Paper Manufacturers Association and the American Paper and Pulp Association.

Alfred Southon

Geo. M. Hunt

Stanley Reed

Geo. B. Tyler

Reed and Tyler Promoted by Crystal Waxing Co.

Recent elections at Crystal Waxing Co., a subsidiary of The Crystal Tissue Co., Middletown, Ohio, resulted in the election of Stanley H. Reed as president of the waxing firm. Concurrently, George B. Tyler was elected secretary.

Mr. Reed has been associated with Crystal Tissue since 1930, spending summer vacations from Ohio Wesleyan University in the plant and as a laboratory assistant on quality control. Since his 1936 graduation from Ohio he has held positions in sales and advertising; in 1946 he became sales vice president for the firm. He will continue his sales responsibilities with the parent firm in addition to the new responsibilities of Crystal Waxing.

Mr. Tyler, formerly assistant secretary of both the parent firm and its subsidiary, fills the board vacancy left with the recent passing of Jasper Kievit. (Cf. P. I., January, 1951). He has been associated with Crystal for the past 28 years.

J. A. Hall Will Direct U.S. Forest Products Lab— G. M. Hunt Retiring

Upon the retirement of George M. Hunt, director of the U. S. Forest Products Laboratory, Madison, Wis., Dr. J. Alfred Hall, now director of the Pacific Northwest Forest and Range Experiment Station of the Forest Service at Portland, Oregon, will assume the post.

Mr. Hunt's retirement ends a 40-year period of continuous association with Federal Service. He has worked with the Madison laboratory since 1913.

Dr. Hall was a member of the laboratory staff from 1930, and returns there after serving as assistant director of the California Forest and Range Experiment Station, director of Central States Forest Experiment Station, and as a wartime supervisor of research of production of rubber from guayule and of ethyl alcohol from wood waste.

C-Z Personnel Changes Affect Seven Executives

Several appointments and promotions have been made by Crown Zellerbach Corp., San Francisco. D. J. Galen, for the past 25 years secretary of C-Z and predecessor firms, has been appointed vice president in charge of purchasing. Mr. Galen became associated with Crown Columbia Pulp & Paper Co. and the Floriston Pulp & Paper Co. in 1908. In 1912 he was appointed confidential secretary to the vice president-general manager of the two firms. Named secretary of Crown Willamette in 1926, he continued in that position after the firm merged with Zellerbach Corp. to become Crown-Zellerbach. Robert T. Kimberlin, who has been assistant to Company President J. D. Zellerbach since 1938, will now serve as secretary.

Promotions concurrently effected included those of: Richard G. Shephard, formerly secretary to the president, now

assistant to the president; William D. Welsh, formerly supervisor of community relations, now director of public relations; P. F. Hiddlebrook, formerly industrial relations assistant, now director of employee relations; Herbert Nylund, formerly accounting supervisor, promoted to assistant treasurer.

J. T. Hughes, formerly assistant treasurer, now is a member of the Industrial and Public Relations Department under Vice President A. R. Heron, with the title of supervisor of employee benefits, including group insurance programs. Mr. Hughes also retains responsibilities for administration of the C-Z retirement fund.

Richard R. Wilhelm

Harold R. Murdock

Wilhelm and Baum Given Sorg Sales Territories

Two sales representatives have recently been assigned territories by The Sorg Paper Co., Middletown, Ohio. Richard R. Wilhelm, salesman for Graham Paper Co. for nine years before joining Sorg in 1950, will service the Southeastern territory. This territory includes North Carolina, South Carolina, Georgia, Florida, Alabama, and parts of Tennessee and Virginia.

Walter T. Baum, connected with Carpenter Paper Co. for several years and recently associated with Wausau Paper Mills Co., will represent Sorg in the territory North and West of Chicago. He will make the firm's Chicago offices his headquarters.

Maurice J. Erisman, chief engineer of the Los Angeles plant of Link-Belt Co., Chicago, has been appointed assistant chief engineer of the firm's Pershing Road plant in Chicago. *Homer J. Foye,* chief engineer at the company's Seattle plant, will succeed Mr. Erisman at Los Angeles.

Thomas F. Glenn has been made manager of the midwestern office of E. P. Lawson Co., Inc., New York. Mr. Glenn, who will make his offices in Chicago, came to the Lawson firm from a post as district sales representative for Mill Printing Machinery Co.

Charles W. Beauchamp, assistant sales manager for silent chain drives at the Ewart, Indianapolis plant of Link-Belt Co., Chicago, has been promoted to assistant sales manager for both silent and roller chain. *H. Merril Bowman,* formerly assistant sales manager at the firm's Chicago plant, has been appointed assistant sales manager at the Ewart plant, and will work with Ewart general products.

Mathieson Engages Murdock to Clear Technical Data

Announcement from the Mathieson Chemical Corp., Baltimore, Md., states that an arrangement has been effected with Dr. Harold R. Murdock, a staff member of Robert & Company Associates, for disseminating technical information that is available in certain research and process plant design.

Dr. Murdock, who is well known throughout the pulp and paper trade here and abroad will function as a qualified and responsible engineer through whom all of Mathieson's technical information will be available to organizations interested in the application of sodium chlorite and chlorine dioxide to the bleaching of wood pulp, as well as the generation of chlorine dioxide from either sodium chlorate or sodium chlorite.

For many years, Dr. Murdock was director of research for the pulp divisions of The Champion Paper & Fiber Co., Hamilton, Ohio. In 1946, he joined General MacArthur's staff in Japan with the responsibility of rehabilitating the Japanese pulp and paper industry. He returned to the industry in 1949 and joined the Robert organization to supervise chemical process design, with special emphasis in pulp and paper. (Cf. P. I., June, 1949)

Callighan & Goodwill Are Made Members of Advisory Board, W. Mich. College

Nominations as members of the Advisory Committee on Pulp and Paper Technology of Western Michigan College have been accepted by O. W. Callighan, manager of special accounts for Edgar Brothers Co., and F. C. Goodwill, resident manager of St. Regis Paper Co. These men will serve a three year term.

Retiring members W. A. Kirkpatrick, technical director of Allied Paper Mills, and Dwight Stocker, president and general manager of Michigan Paper Co., will work with the committee as chairmen of the student recruitment committee and the plant visitation committee, respectively.

Dr. Wynard Wichers, vice president of the college, has been named a temporary member of the Advisory Committee until such time as the vacancy left with the recent passing of Dr. Deyo Fox, former director of Vocational Education at the College, can be permanently filled.

Iverson to Join Towmotor Corp.

The appointment of E. C. Iverson as chief engineer of The Towmotor Corp., Cleveland, has been announced. He assumed his new duties February 1.

Mr. Iverson terminated association with J. D. Adams Manufacturing Co., Indianapolis, where he was in charge of all product design and development, to accept the Towmotor appointment.

E. C. Iverson

John P. Rich

John Rich now President of Improved Paper Mach'y Corp.

The election of John P. Rich to the presidency of Improved Paper Machinery Corp., Nashua, N.H., climaxes an association with the company lasting over a period of 20 years.

Mr. Rich's graduation from M.I.T. with a B.S. degree, was followed by one year with the Groveton Paper Mills, Groveton, N.H. He was first associated with Improved Paper in 1931 when he became a mechanic in the shop.

In 1935, Mr. Rich was made a director of the company; he became secretary a short time later. In 1938, he was appointed assistant to the president, and was made executive vice president in 1947. From this office, he has advanced to the presidency.

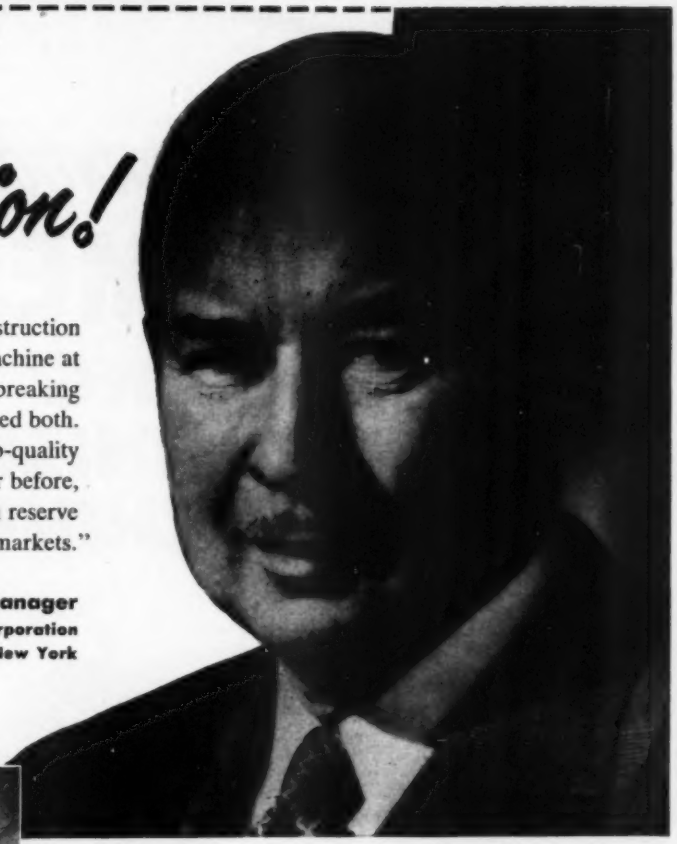
Impco's former president, Walter L. Barker, is now chairman of the board.

Riegel Appointments

Several executive appointments have been effected by Riegel Paper Corp., New York. R. L. Kerridge, formerly manager of the Upper Mills as well as a director of the firm, has been appointed assistant to Walker Hamilton, executive vice president. Mr. Kerridge will be located at the New York offices of the company.

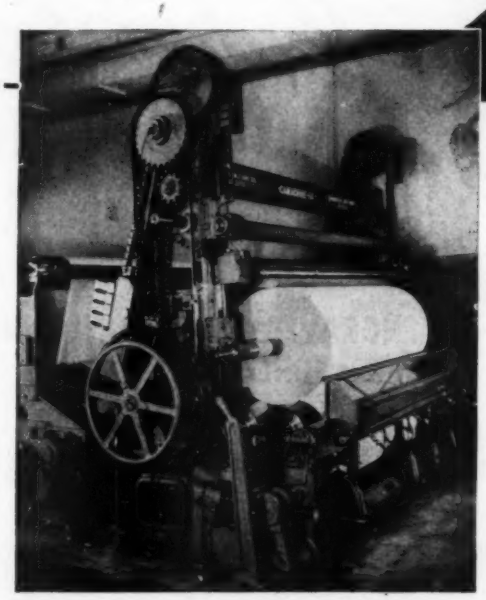
Allan Schenck will assume the duties of technical superintendent of the Hughesville and Riegelsville mills, work-

They emphasize *production!*



"WHEN WE WERE PLANNING construction of our revolutionary new coating machine at Johnson City, N. Y., we asked for record-breaking capacity, and *reserve capacity*. We achieved both. We're producing and converting top-quality sensitized papers faster than ever before, and we still have plenty of capacity in reserve to meet new demands in expanding markets."

JAMES FORRESTAL, General Manager
OZALID, Division of GA&F Corporation
Johnson City, New York



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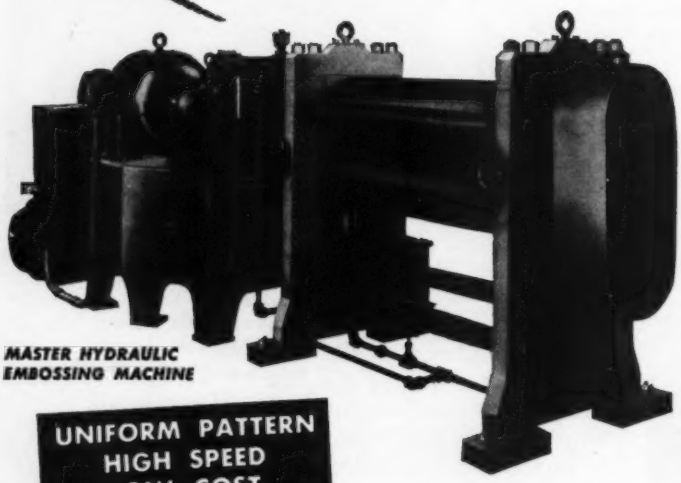

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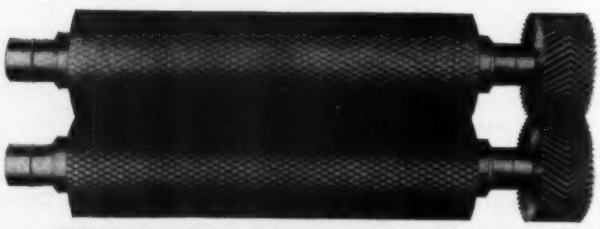

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MODERN ENGRAVING & MACHINE CO.

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ing under the supervision of the firm's vice president in charge of production. J. B. Lockhart, Jr., will continue as assistant to the vice president in charge of production, but will assume the additional responsibilities of production planning for the Hughesville, Riegelsville and Warren mills.

Robert H. Owens

Ralph R. Newquist

Owens Elected Pres.- Newquist Is Vice Pres. of Roots-Connersville

Filling a vacancy left with the recent passing of John Avery (Cf. P. I., February, 1951) Robert Owens has been elected president and general manager of Roots-Connersville Corp., Connersville, Inc., a subsidiary of Dresser Industries, Inc., Dallas, Texas. Mr. Owens, associated with Roots-Connersville and its predecessor, P. H. & F. M. Roots Co., since 1925, was named vice president of engineering and manufacturing for the firm in 1946, and joined the board of directors in 1948.

Ralph R. Newquist, who has served as vice president in charge of sales for the company since 1946, was concurrently elected executive vice president. A graduate of Penn State College, Mr. Newquist was manager of the Washington sales office of Allis-Chalmers Manufacturing Co., Milwaukee, before joining Roots-Connersville.

W. A. Roberts New Pres. of Allis-Chalmers—Other Officials Elected

Executive vice president in charge of the tractor division of Allis-Chalmers Manufacturing Co., Milwaukee, Wis., since 1947, William A. Roberts, was elected president of the firm at a recent special board meeting. Mr. Roberts succeeds Walter Geist, who served as president from 1942 until his recent passing. (See Necrology)

The board also elected four new vice presidents: W. C. Johnson, formerly executive vice president in charge of general machinery division, was named executive vice president for the entire company; J. L. Singleton, formerly vice president and director of sales, general machinery division, was made vice president in charge of general machinery division; Fred Mackey, formerly general works manager, general machinery division, was elected vice president in charge of manufacturing of that division; R. S. Stevenson, former general sales manager of the tractor division, was named vice president in charge of tractor division; A. W. Van Hercke, formerly director of engineering for the tractor division, was named vice president in charge of engineering for that division; and John Ernst, formerly general works manager of the tractor division, became vice president in charge of that division's manufacturing.

Robert Lea Retires from Johns-Manville to go with Olin Industries

In September, 1946, Robert W. Lea was elected president of Johns-Manville Corp. On February 1, this year, he retired from that position to join Olin Industries, Inc.; he has been a director of that organization since April, 1950.

Mr. Lea became associated with Johns-Manville in 1939 as vice president for finance; he was elected a director in 1940. In January, 1946, he became executive vice president. In addition, he has had varied industrial executive experience and served as assistant administrator of the NRA under Gen. Hugh S. Johnson, as well as filling other positions in the Government during World War II.

de Spain Leaves Brown Co. to Go with Chas. T. Main, Inc., as Engineer

A former project engineer for Brown Co., Berlin, N. H., Arthur L. de Spain, has joined Chas. T. Main, Inc., Boston, as a project engineer in the company's pulp and paper division.

A graduate of Westminster College, Mr. de Spain has been a pulp and paper chemical and process engineer since 1929. His earlier associations were with General American Process and Equipment Co.; Geo. F. Hardy, consulting engineer; Bloedel, Stewart & Welch; E. I. du Pont et de Nemours, Hanford, Wash., atomic bomb project; and Chemical Processes, Inc., Niagara Falls, N. Y.

Legge and Santen Become Riegel Carolina Corp. Board Members

The election of Harry A. Legge and Herman W. Santen as directors of Riegel Carolina Corp. has been announced. Mr. Legge is president and a member of the board of the Howard Paper Mills Inc., Urbana, Ohio, and a director of the Edward Hines Lumber Co., Chicago. Mr. Santen, a member of the Cincinnati Bar, is assistant treasurer and a director of Howard.

It has also been announced that Howard Paper Mills will utilize some of the production of the new Riegel pulp mill at Acme, N.C., now under construction. (See P. I., September, 1950) Plans call for a paper machine to be installed there in the future, as well as facilities for installation of further machines as future plans and conditions warrant.

Harold Hoppens Named to Libbey-Owens-Ford Plaskon Post

Although he has been appointed associate director of research for the Plaskon Division of Libbey-Owens-Ford Glass Co., Toledo, Ohio, Dr. Harold Hoppens will continue to be in charge of the company's coating resin research, the work he has done since joining the firm nine years ago.

A past chairman of the Toledo Section of the American Chemical Society, Dr. Hoppens received his Ph.D. and M.A. from Iowa State University, and his bachelor's degree from Creighton University. He holds several patents for work done in synthetic resin research.

Dr. Harold Hoppens

S. B. Applebaum

S. B. Applebaum Now Mgr. Water Treatment Div. of Cochrane Corp.

The appointment of S. B. Applebaum as manager of the Water Treatment Division of Cochrane Corp., Philadelphia, has been announced.

Mr. Applebaum, who has specialized in water conditioning work for more than 30 years, joined Cochrane in 1949; since that time he has been manager of the Cold Process section of the Water Treatment Division. The founder of Liquid Conditioning Corp., Mr. Applebaum has been a vice president of that corporation since it became a subsidiary of Cochrane.

D. S. Denman, vice president of Crown-Zellerbach, has transferred his offices from Seattle to the company headquarters in San Francisco, where he is now serving as a member of the C-Z

executive committee. Concurrently, *Oakley Dexter*, assistant vice president, was named senior officer of the Seattle division; while he retains his title as assistant vice president, he now has relinquished his duties as purchasing director.

Peyton S. Hopkins has been named to manage the Washington, D.C., offices of The Rust Engineering Co., Pittsburgh, succeeding *Richard L. Butler* who is retiring after 20 years of service to the company. Mr. Hopkins has been international representative for Eastern Air Lines in Washington since 1947, and was associated with Rust for several years prior to World War II.

Eugene R. Hammes has been named a sales representative in the Chicago area for the paper division of Minnesota and Ontario Paper Co., Minneapolis. Mr. Hammes terminated an association with Reliance Paper Co., Chicago, to join Mando's sales force; earlier associations include Graham Paper Co. and Butler Paper Co., Chicago.

F. Henry Savage has been promoted to the newly created position of assistant general sales manager of International Paper Co., New York. A veteran of 29 years with International Paper, Mr. Savage has been sales manager of the company's book and bond division since 1930.

W. Harrington Walker has been appointed vice president of Central Ohio Paper Co., Columbus, Ohio, and manager of the firm's Toledo, Ohio, branch. He succeeds *Warren Glass*, now assuming less arduous work for reasons of health. Mr. Walker, who has been associated with the firm for 31 years, was most recently personnel manager of the Columbus division.

Franklin T. Griffith was elected chairman of the board of directors of Griffith Rubber Mills, Portland, Oregon, at a recent meeting of company stockholders. *Zina A. Wise*, mill manager since 1913, was elected president of the company, the position heretofore held by Mr. Griffith.

C. L. Myers, felt mill superintendent for Certain-teed Products Corp., Niagara Falls, N.Y., for the past five years, has resigned that position to accept an assignment as mill manager for C. H. Norton Co., North Westchester, Conn.

E. O. Dixon

T. L. Swansen

Dixon and Swansen Given Ladish Co. Appointments

Two appointments, those of E. O. Dixon as vice president in charge of research and metallurgy and T. L. Swansen as vice president in charge of manufacturing, have been announced by Ladish Co., Cudahy, Wis.

Mr. Dixon, known as one of the foremost metallurgists in the forging industry, has been associated with Ladish for more than 20 years; Mr. Swansen went to Ladish as chief engineer in 1947, and became general superintendent in 1949.

R. W. Hooker, vice president in charge of sales of Hooker Electrochemical Co., Niagara Falls, N.Y., was elected first vice president of the Compressed Gas Association, Inc., at its annual meeting January 22; two days later he was re-elected president of The Chlorine Institute, Inc. His service with both groups has been of long standing.

Orville C. Munger, formerly mechanical superintendent at the Carthage, N.Y., National Paper Products Division of Crown Zellerbach Corp., San Francisco, has been made resident engineer of the plant. *Thomas I. Meehan*, assistant mechanical superintendent, was named mechanical superintendent, and *James F. Murtha*, paper mill shift supervisor, has become assistant paper mill superintendent.

C. E. O'Connor, Jr., has been elected vice president of the Diamond Match Co., New York. He has served the firm as special assistant to the president since 1947, leaving a vice presidency at B-F-D Company when that firm was acquired by Diamond.

James R. Shea, resident manager of the Tyrone, Pa., plant of West Virginia Pulp and Paper Co., New York, was elected a director of the company at a recent stockholder's meeting. Concurrently, *L. Frank Thompson*, newly appointed resident manager of the company's Charleston, S.C., Mill, (Cf. P. I., January, 1951) assumed a similar directorship.

Robert D. Rusch, formerly technical advisor and assistant general superintendent of International Paper Co., Tonawanda, N.Y., became mill superintendent of Mosinee Paper Mills Co., Mosinee, Wis., on February 15. Mr. Rusch's position at International has been entrusted to *Ward Arnold*, assistant technical superintendent there since 1948.

A. E. Giegengack has been elected vice president and eastern sales manager of Electrographic Corp., and will make his headquarters at the newly established New Haven Electrotype Division in New Haven, Conn. Mr. Giegengack, United States public printer for 14 years, was organizer and manager of the Sixth Annual Educational Graphic Arts Exposition held recently in Chicago.

J. J. Llanso, vice president and manager of Worthington Ltd., Buenos Aires, Argentina, since 1947, has been appointed general export manager of Worthington Pump and Machinery Corp., Harrison, N.J.

Rogers Weed has been named to the newly created position of assistant to the vice president of the building materials division of Bird & Son, Inc., East Walpole, Mass. Mr. Weed's successor as northern division sales manager is *Edmund F. Murphy*. Concurrently, *John J. Murphy* has been made assistant director of personnel, and *E. Russell Pulsifer* is now director of industrial engineering.

J. C. Nutter has been appointed chief engineer of Gair Co. Canada, Ltd. For the past five years associated with John Inglis Co. Ltd., Mr. Nutter was at one time manager of the Toronto mill division of Gair Co. Canada.

Ancel C. Adams has been appointed general plant superintendent of The Cleveland Crane & Engineering Co.,

Wickliffe, Ohio. During the 28 years he has been with Cleveland Crane, Mr. Adams has served as manager of the shipping receiving and stores department, as traffic manager, and most recently as assistant plant superintendent.

John Maloney Promoted to Vice Pres. by Hoberg

At the recent annual board meeting of Hoberg Paper Mills, Green Bay, Wis., John Maloney was elected vice president-sales manager of the firm. A member of the sales staff since 1924, Mr. Maloney has served as sales manager for the past eight years. The vice presidency in the sales department is a newly created office.

Concurrently these officers were re-elected: J. M. Conway, president and general manager; Thomas J. Dee, vice president; H. G. Wintgens, vice president-assistant general manager; Martin J. Auchter, vice president of manufacturing; P. M. Chiuminatto, secretary-treasurer; and Miss Edna Decker, assistant secretary.

Gordon B. Shattuck has been appointed assistant to the manager of supply of the home office mills of Strathmore Paper Co., West Springfield, Mass. Concurrently, *Bemis P. Wood* was named superintendent, *William L. Bryan* was chosen assistant superintendent, and *Robert E. Hosmer* and *Ludwig Ruzicka* were made night assistant superintendents.

Dr. Robert J. Meltzer has been appointed to the scientific bureau of Bausch & Lomb Optical Co., Rochester, N. Y. Before receiving his doctorate in physics from Johns Hopkins University last year, Dr. Meltzer served for two years as a research assistant for the armed services' guided missiles program at Naval Research Laboratories and Massachusetts Institute of Technology.

Samuel C. Knode, vice president of sales for Albemarle Paper Manufacturing Co., Richmond, Va., passed away February 10 at the age of 75. Mr. Knode, associated with Albemarle for some 40 years, was a former president of the Salesmen's Association.

Thomas Cornils, associated with Link-Belt Co., Chicago, since 1928, succeeds *Homer J. Foye* as chief engineer of the firm's Pacific Northwestern Division upon Mr. Foye's appointment as Link-Belt's chief engineer in Los Angeles.

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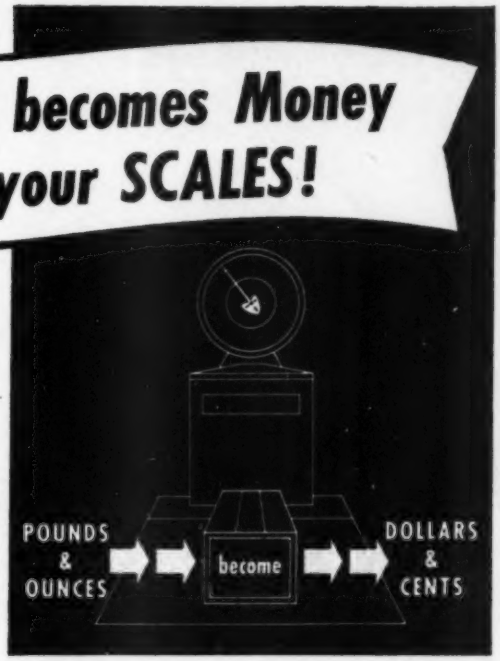

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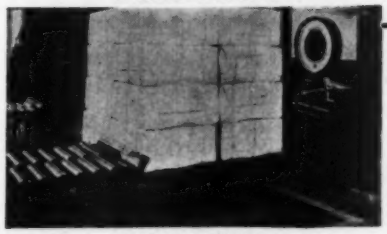

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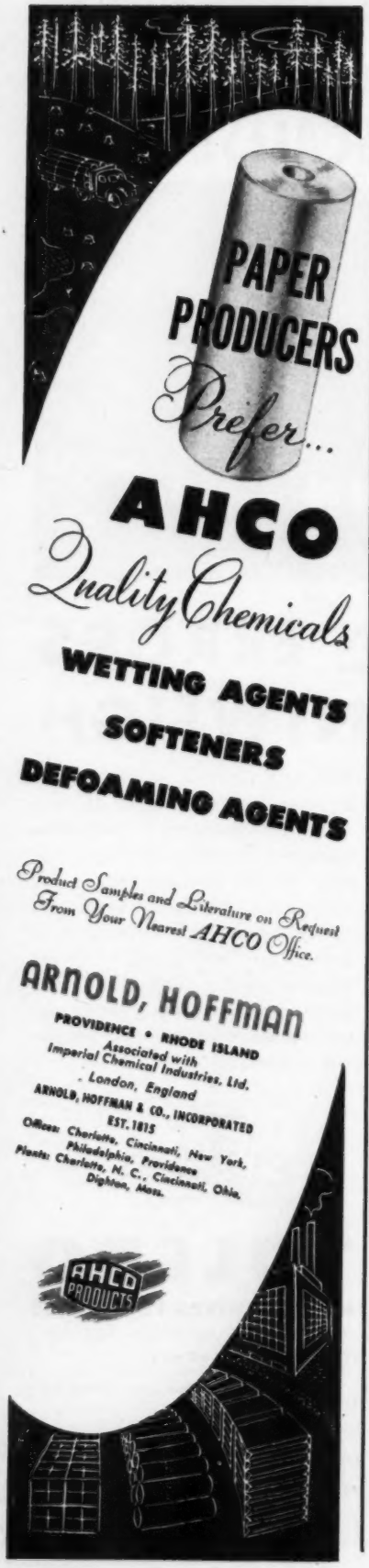

The Paper Industry Necrology

Harry H. Straus

A leading pioneer in the development of cigarette paper manufacture in the United States, Harry H. Straus, president and chairman of the board, Ecusta Paper Corp., Pisgah Forest, N. C., passed away suddenly February 27. He was 67 years of age.

Harry H. Straus

Mr. Straus was known internationally for his success in the manufacture of cigarette paper from flax. He was born in Mannheim, Germany. At the age of 18, he came to the United States to study English; he liked the country and stayed. He first worked for a company making cork tips for cigarettes; later he became a cigarette paper salesman. He imported paper from France, and to make sure of his supplies he acquired control of a French mill. French factories then were making about 90 per cent of the cigarette paper used in the United States.

From then on, his life was filled with industry; he bought and founded several companies—all affiliated with the manufacture of cigarettes—before he began the development of a plan to build a mill to make cigarette paper from flax.

He and his engineers explored a number of sites for such a plant, and after many surveys the one at Pisgah Forest was chosen, principally because of the pure water flowing in the Davidson River. The fine plant of Ecusta was completed in 1939, and it has expanded almost continuously since then.

Not only did Mr. Straus succeed in building a mill that is unique, but he has spared no expense or effort to surround it with a fine community for his employees.

Surviving are the widow, a son, Harry Straus, Jr., and a daughter.

Walter Geist

President of Allis-Chalmers Manufacturing Co., Milwaukee, Wis., since 1942, Walter Geist, passed away January 29 at the age of 56.

Mr. Geist left high school in 1909 to join Allis-Chalmers. While working as a messenger boy, he took evening and extension courses at the University of Wisconsin. Soon he became a tracer in the milling department, and was promoted to draftsman and engineer before being named assistant manager in 1928.

Transferring to the firm's sales department, Mr. Geist demonstrated the V-Belt Texrope drive he had developed while a member of the engineering department; in 1933 he was named general sales representative of the General Machinery Division, and in 1939, vice president of that Division. He was selected as executive vice president, and then president, in 1942.

An active worker in civic organizations, Mr. Geist served as president of several community welfare groups, organized programs for the rehabilitation of socially misfitted workers, only recently inaugurated a club for retired Allis-Chalmers employees, and was responsible for the establishment of a program which provides college scholarships to 20 children of Allis-Chalmers employees each year.

Mr. Geist is survived by the widow and two children.

Edgar Rickard, for many years president of Pejepscot Paper Co., Brunswick, Maine, passed away January 21 at the age of 77. Mr. Rickard, internationally known as an engineer, was a life-long associate of Herbert Hoover, with whom he did extensive work on European relief after World War I.

John H. Smith, former president of Hawley Pulp and Paper Co., Oregon City, Oregon, passed away December 15. Mr. Smith became president of Hawley about 20 years ago and remained in that position until the firm was sold to Publisher's Paper Co. about two years ago.

Henry L. Harrington, former president and treasurer of the Berkshire Hills Paper Co., Adams, Mass., passed away January 29 at the age of 80. Mr. Harrington became owner and president of the Berkshire firm in 1904, and held those offices until the 1928 sale of the mill to Brightwater Paper Co.

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The wire in an ear aid transforms an abode of silence into a world of delight.

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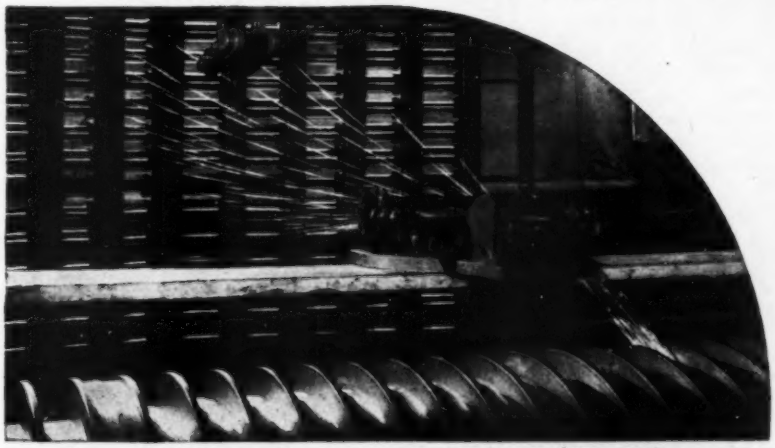

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Every strand of wire cabled by Lindsay is processed with minute care ("head" of cabling machine shown).

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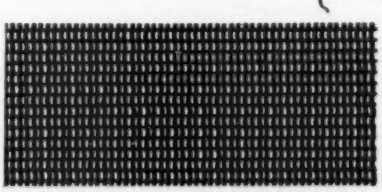
The total cannot be other than the sum of its parts. A wire cannot rise above the excellence of its individual strands. Lindsay refuses to "wind on" a wire unless every composite strand has survived the most exacting ordeal of laboratory and inspection. Each step which precedes and follows the winding on and weaving operations is subjected to tests just as conclusive and thorough.



THE LINDSAY WIRE WEAVING COMPANY
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The Paper Industry Safety News

"Pete" Marconi Leaves NSC for new Safety Engineer's Job

The resignation of E. P. ("Pete") Marconi from his position as engineer with the National Safety Council, Chicago, will become effective March 30. Mr. Marconi leaves NSC to become safety engineer with Aro, Incorporated, which will manage and operate the new Arnold Engineering Development Center being constructed at Tullahoma, Tenn.

E. P. Marconi

Mr. Marconi first became associated with National Safety Council in March of 1945. Previously, he had been safety engineer and chief of plant protection for the American Export Airlines in New York City. Three months after he became affiliated with NSC, he was called into service; during World War II he spent a year in Naval Air Transport Service, stationed on Guam. He returned to National Safety Council in April, 1946, and was assigned to the Pulp and Paper Section, also two Aviation sections.

The work accomplished by Mr. Marconi since he has functioned as engineer for the Pulp and Paper Section has brought both recognition for his efforts and a record of progress to the Section. Improvements instituted by him included:

(1) Re-organization of the Pulp and Paper Committee and preparation of a 5-year plan of publications for the industry, and (2) co-ordination in preparing more than 40 pamphlets, data sheets, engineering studies, and other publications on safety in the paper industry.

Innovations credited to Mr. Marconi's efforts were: Discussion-type meetings at the Annual Congress, handbook for Section officers, and best safety device contest. He also developed the first Safetygraph, and was author of ten of the sixteen in the series.

"Pete" was considered a specialist in the development and use of training aids. During the time he was working with the Pulp and Paper Section, he made many friends among mill executives and safety directors. He appeared at numerous safety gatherings held by paper mill employee groups and always contributed inspirational safety talks on such occasions.

A RECORD WAS ESTABLISHED by the Northern Division of International Paper Co. in 1950, when a total of only 72 lost-time injuries was reported by the group. This reduction in lost-time accidents—a drop of eight from the 1949 total—earned the Division a combined frequency rate of 7.29.

Final Scores Announced in 1950 Contest

▶▶▶ THE PAPER INDUSTRY safety contest for 1950 started with 374 contestants. During the year, new participants were added so that 400 mills completed the contest. This record exceeds the previous year when 360 companies were in at the finish of the contest.

Following are names of contestants that will be awarded trophies and certificates. Those ranking 1 will received first place trophies; participants ranking 2 and 3 will receive certificates. Thirty-seven mills, including three with below minimum exposure finished the contest with perfect records.

From these group winners, the board of judges will choose the mill with the most outstanding record. That mill will be awarded the Grand Prize, the Edward Benton Fritz Memorial Trophy.

Division I—Pulp and Paper Mills

Group A

1—Wood Conversion Co., Cloquet, Minn.
2—Longview Fibre Co., Longview, Wash.
3—Champion Paper and Fibre Co., Hamilton, Ohio

Group B

1—Crown Zellerbach Corp., Port Townsend, Wash.
2—Marinette Paper Co., Marinette, Wis.
3—Quebec North Shore Paper Co., Baie Comeau, Canada

Group C

1—West Virginia Pulp and Paper Co., Williamsburg, Pa.
2—Mead Corp., Heald Division, Lynchburg, Va.
3—St. Anne Paper Co., Beaupre, Canada

Group D

1—Certain-teed Products Corp., York, Pa.
1—Certain-teed Products Corp., Savannah, Ga.
1—Certain-teed Products Corp., East St. Louis, Ill.
1—Philip Carey Co., Lennoxville, Que., Canada
1—U. S. Gypsum Co., Oakmont, Pa.
1—Lloyd A. Fry Roofing Co., Brookville, Ind.
1—Certain-teed Products Corp., Marseilles, Ill.
1—Armstrong Cork Co., Pensacola, Florida
1—National Gypsum Co., Kalamazoo, Mich.
1—U. S. Gypsum Co., No. Kansas City, Mo.
1—American Writing Paper Corp. (Nonotuck Division), Holyoke, Mass.
1—Mead Corp., Nashville, Tenn.
1—Johns-Manville, Tilton, N.H.
1—American Writing Paper Corp. (Mt. Tom Division), Holyoke, Mass.
1—Kimberly-Clark Corp of Canada, Kapuskasing, Canada
1—Spaulding Fibre Co. (Hayes Plant), North Rochester, N.H.

Division II—Paper Converting

Group A

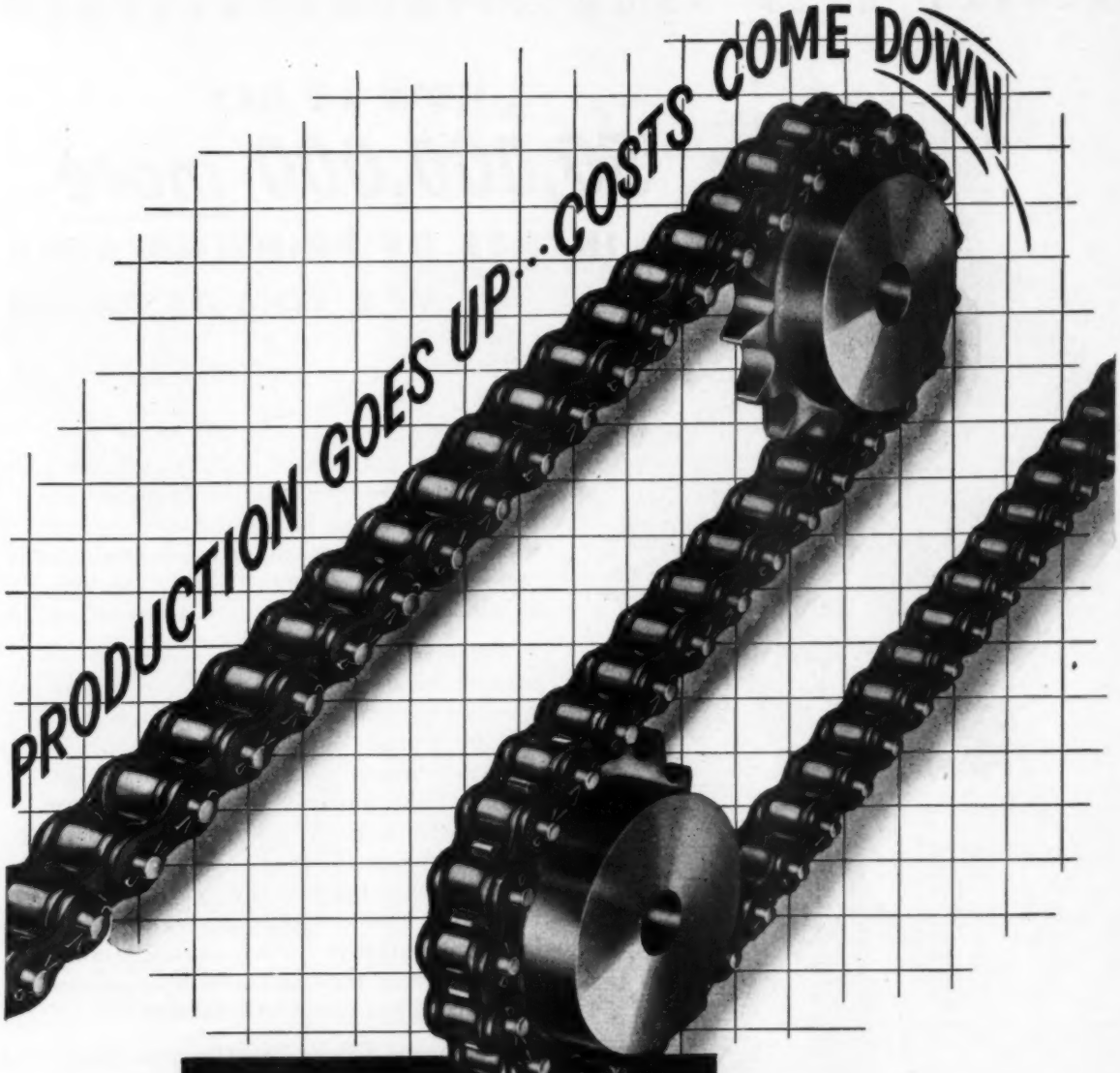
1—Stone Container Corp., Chicago, Ill.
2—Lily Tulip Cup Corp., College Point, N.Y.
3—Continental Can Co. (Container Co. Division), Van Wert, Ohio

Group B

1—Canadian Cellucotton Products, Niagara Falls, Canada
1—Hankins Container Co., Union, N.J.
3—Old Colony Envelope Co., Westfield, Mass.

Group C

1—Kimberly-Clark Corp., Appleton, Wis.
1—Bird and Son, Inc., Chicago, Ill.
1—Container Corp. of America, Greensboro, N.C.
1—St. Regis Paper Co., Nazareth, Pa.
1—Lily Tulip Cup Corp., Galva, Ill.
1—Certain-teed Products Corp., Dallas, Texas
1—Pillsbury Mills Inc., Wellsburg, W. Va.
1—Container Corp. of America, Philadelphia, Pa.
1—Thilmany Pulp and Paper Co., Kaukauna, Wis.
1—St. Regis Paper Co. Ltd., Dryden, Ont., Canada
1—Lily Tulip Cup Corp., French Lick, Ind.
1—Bay West Paper Co., Green Bay, Wis.
1—Lloyd A. Fry Roofing Co., Minneapolis, Minn.



with— **WHITNEY CHAIN DRIVES**

Service records prove the unusual ability of Whitney Chain Drives to deliver full rated horsepower day in, day out, without failure. To you, as a designer or user of equipment, this means time and dollars saved. Production goes up *and stays up*, while *costs come down.*

HERE'S WHY — the rolling contact of finely finished, alloy steel chain, meshing into accurate, cut tooth sprockets eliminate power loss because there is no slippage or friction loss. They deliver constant power smoothly and efficiently.

In addition, they absorb shock loads without breakage. And Whitney's alloy steel construction assures exceptionally long operating life . . . a vital point in keeping maintenance costs down.

But that's not all . . . Whitney Chain Drives simplify design problems. They can be operated on long or short centers without tension or excess bearing loads . . . drive shafts clockwise or counter-clockwise, simultaneously. They can be installed or taken off without dismantling shafts or bearings.

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In addition to the service facilities of more than 130 Whitney Distributors, Whitney maintains a network of 15 Field Engineering Offices, located throughout the country. The experience gained through more than 50 years of solving drive problems is at your service. From the complete line of Roller, Silent and Conveyor Chains, Whitney Engineers can recommend, without bias, the proper type of drive for your application...the chain drive which will give you the best service at lowest cost. Consult your nearest Whitney Field Office or write us direct for catalog and complete information.

WHITNEY CHAIN COMPANY

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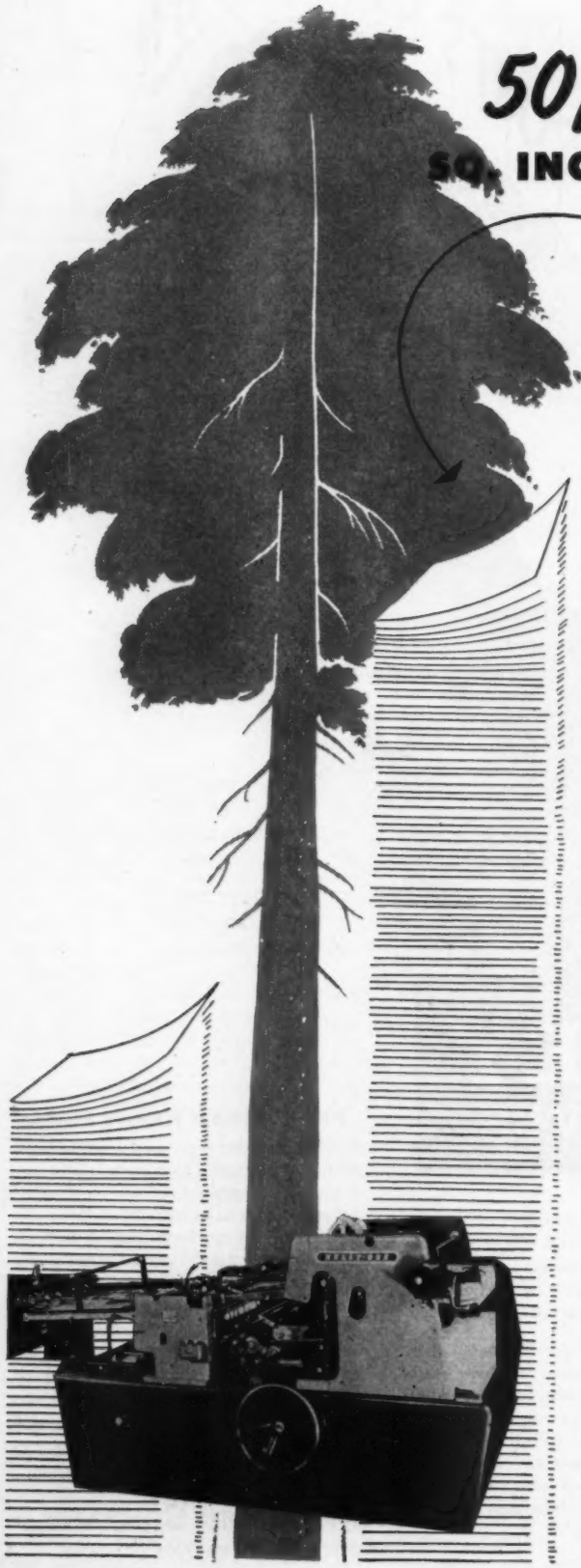
TIMELY HELP FROM TITANOX RESEARCH



HOW TO GET

50,000,000 *more*

SQ. INCHES OF PRINTING AREA PER TON OF PAPER

Light-weight, 20-pound coated paper, pigmented with TITANOX, can provide 50,000,000 *more* square inches of printing area per ton than ordinary 40-pound stock with no increase in show-through, no loss in brightness or opacity. Such processing provides a practical way to utilize paper making materials more effectively.

In the interest of better paper making, TITANOX research has developed titanium dioxide pigments specially suited for whitening, brightening and opacifying paper and has established definite recommendations for their use. For example, TITANOX-A-WD, the water-dispersible titanium dioxide and the rutile-calcium pigment TITANOX-RCHT are suggested for use in coatings. TITANOX-A-WD is also specially recommended for addition to the beater. Each of these pigments has the fine and optimum particle size which imparts maximum whiteness, brightness and opacity . . . ensures easy mixing and complete dispersion.

Our Technical Service Department is always ready to help you make the best use of TITANOX pigments. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments, Ltd., Montreal 2; Toronto 1.

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The Paper Industry Practical Shorts

Fig. 1—Clean the broken edges. Remove grease, rust, and paint. Then bevel the broken edges but leave untouched sections to help line up the parts

Fig. 2—Adjust the flame for an excess of oxygen and warm the sprocket. Tin the edges and add weld metal. Braze-weld the spokes on both sides

Fig. 3—Warm the sprocket again and weld both sides of one rim break. Then weld the other break. Build up welds higher than the surface.

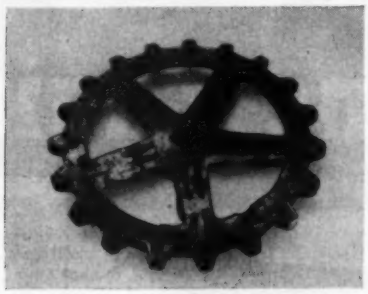


Fig. 4—When welds are finished, let sprocket cool slowly away from drafts. Excess weld metal need not be removed if there is no interference with operation of socket

How to bring worn parts back to life

Sprockets and gears are parts that get severe wear. Spokes and rims break and many times teeth are broken off. But repairs can be made quickly and easily with an oxy-acetylene welding blowpipe and bronze welding rod.

With a blowpipe and bronze welding rod, you can return parts to service fast. Broken rims, spokes, or hubs can be quickly repaired. Worn gear teeth can be built up, and after they're finished to their original size, the gear is ready to go back to work.

This sprocket is a good example of one of the simpler braze-welding repair jobs. It shows how a broken, discarded part can be taken from the scrap heap and "brought back to life."

The pictures and captions on this page show how to make the repair. Listed below you will find some general hints for all your braze-welding jobs. If you follow them and practice on old parts you'll find that it's easy to do any repair by braze-welding.

1—Clean the weld areas thoroughly to remove grease, rust, and dirt.

2—Heat the part only to a dull red heat. Be sure it does not melt at any time.

3—When the metal is at the proper temperature, dip the heated end of the rod in flux, melt the rod and form a small puddle.

4—If the puddle is too hot the weld metal will boil and bubble. Draw the flame back for a few seconds. If the puddle is too cool, the molten bronze will form small balls and won't flow.

5—Dip the rod into the flux often during welding.

6—When adding molten rod metal to the puddle, place the end of the rod at the bottom of the puddle.

7—Don't overheat the base metal at any time during the welding or the weld puddle will boil and there will be excessive fuming.

—From *Linde Tips*, published by THE LINDE AIR PRODUCTS CO.

Skid-Proof Coating

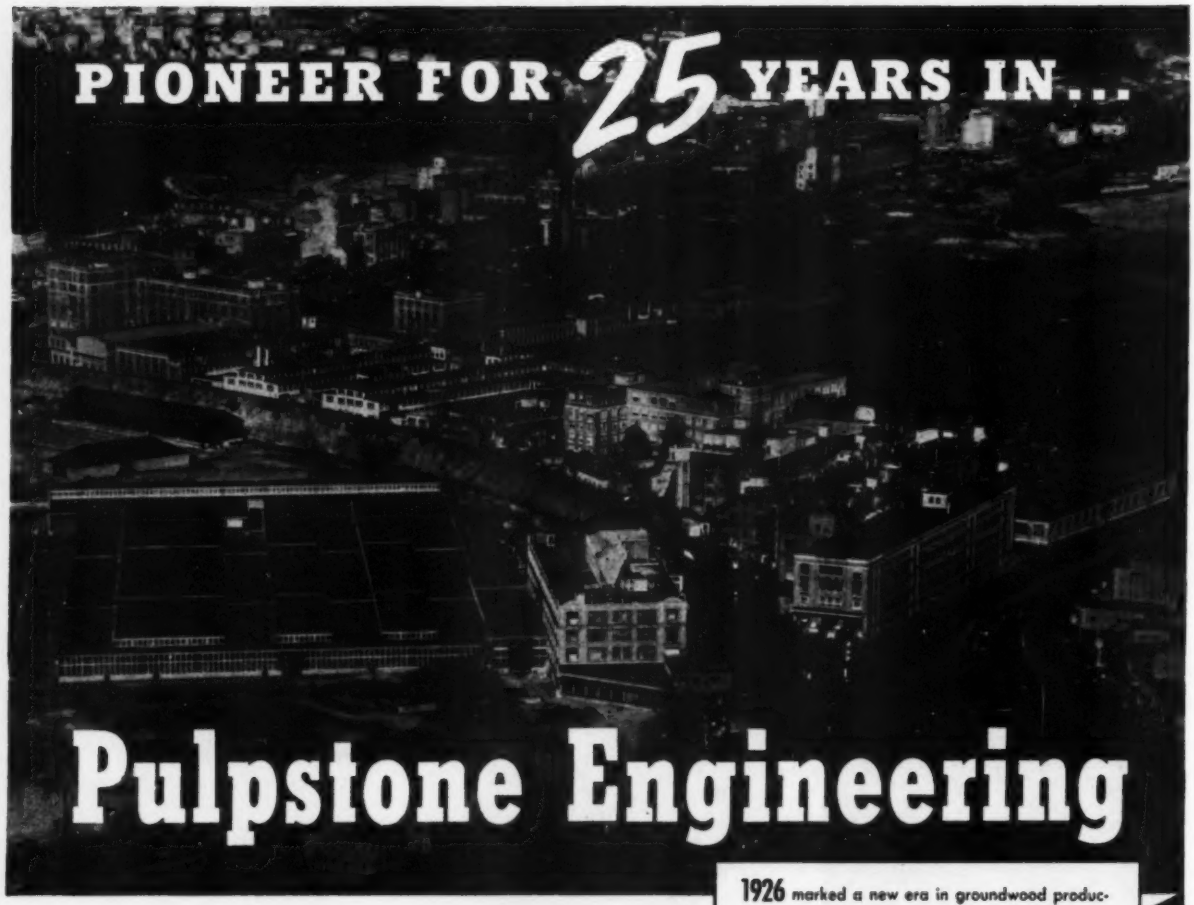
In most industrial plants there are steps, floors, walkways or truck runways that become slippery when wet. They're not only safety hazards but maintenance problems as well. One practical solution is to use a special slip-proof Neoprene coating for such surfaces. A primer coat is first painted on. After it has dried, a heavier coating of special Neoprene compounds in solvent solution is poured on, then spread to the desired thickness with a brush. Sifted sand is immediately sprinkled over the coating and partially embedded in the viscous cement. When the solvent is evaporated and the Neoprene binder is air cured, a floor covering with a non-skid surface is obtained. Neoprene provides good resistance to heat abrasion, sunlight, weathering, oils, acids and many chemicals. This particular coating bonds well to wood, steel or concrete and has proved to be economical, easy to apply, and long-lasting.—From *The Neoprene Notebook*, published by E. I. Du Pont de Nemours & Co., Inc.

Handy Formulas

1. To find belt speed in feet per minute
   $\text{Speed} = 0.262 \times D \times N$ or
   $= 0.262 \times d \times n$
2. To find length of belt in inches on open drive
   $$\text{Length} = 2C + 1.57(D + d) + \frac{(D-d)^2}{4C}$$
3. To find length of belt in inches on crossed belt drive
   $$\text{Length} = 2C + 1.57(D+d) + \frac{(D+d)^2}{4C}$$
4. To find arc of contact of belt in degrees on smaller pulley
   $$\text{Arc} = 180^\circ - \left[\frac{57.3(D-d)}{C}\right]$$
5. To find length of belt in inches on quarter turn drive
   $$\text{Length} = 1.57(D+d) + \sqrt{C^2 + D^2} + \sqrt{C^2 + d^2}$$
   Where
   D = Diameter of larger pulley in inches
   d = Diameter of smaller pulley in inches
   C = Distance between pulley centers in inches
   N = Speed in R.P.M. of larger pulley
   n = Speed in R.P.M. of smaller pulley
6. To find number of feet of belting in a roll
   $L = 0.1309 \times N \times (D+d)$
   Where
   L = Length of belting in feet
   N = Number of loops in roll
   D = Outside diameter of roll in inches
   d = Diameter of core or hole in inches

—From *Leather Belt Drive News*, published by The American Leather Belting Association.

PIONEER FOR 25 YEARS IN...



Pulpstone Engineering

1926 marked a new era in groundwood production. For the first time the grinding of pulp became a controlled operation with the introduction of the Norton Pulpstone whose abrasive, grit size, hardness and structure could be accurately selected to produce just the desired type of pulp.

And Norton has continued to pioneer — not only in improvement of the stone itself but also in providing complete pulpstone engineering service. You'll find that the Norton pulpstone engineer can not only specify just the right kind of stone to meet your pulp requirements but that his years of experience in the pulp and paper industry will enable him to give you many helpful suggestions for producing better pulp—*and more economically.*

Behind him at Worcester he also has available skilled engineers on abrasives and grinding wheels for knife grinding, roll grinding and other applications, experts on high temperature refractories and porous mediums, on grinding machines, and the many other Norton products.

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PULPSTONES

Making better products to make other products better

Abrasives · Grinding Wheels · Grinding and Lapping Machines · Refractories · Porous Mediums · Non-slip Floors · Norbide Products · Labeling Machines

The Paper Industry International Review

ECA Authorizations

The Economic Co-operation Administration has announced these procurement authorizations:

Belgium-Luxembourg (pulp and paper, paper products, except pulpwood and newsprint) $200,000 from United States and Possessions and Canada; contract period January 25, 1951—May 31, 1951; terminal delivery date November 30, 1951.

Thailand (pulp, paper and paper products) $1000 from United States and Possessions; contract period December 19, 1950—April 30, 1951; terminal delivery date October 31, 1951; procuring agency, General Services Administration.

Indo-China (pulp, paper and paper products, except newsprint and pulpwood) $20,000 from United States and Possessions; contract period January 19, 1951—May 31, 1951; terminal delivery date November 30, 1951; procuring agency, GSA.

Greece (newsprint) $250,000 from Canada; contract period January 29, 1951—June 30, 1951; terminal delivery date December 31, 1951.

A FAVORABLE REPORT on the prospects of erecting paper mills in Puerto Rico and the Dominican Republic is being prepared by Harry Williamson, vice president of North Wilbraham Paper Co., North Wilbraham, Mass., and author of several papermaking texts. Mr. Williamson considers raw materials available in those countries—office waste, residual growth from bagasse straw and sisal—could be used to manufacture newsprint and other types of paper. Water supplies in the two countries are considered ample for processing, according to Mr. Williamson.

SHORTAGE OF NEWSPRINT in Buenos Aires, Argentina, is said to be so acute that stock on hand cannot last more than a few more days. A 40 ton shipment recently imported from France was allotted by the government to *La Prensa*, which would have been unable to continue publication without the allotment. As an attempt at solution of the shortage, said to be due to a lack of dollars, the Argentine government last year expropriated stocks from *La Prensa* and *La Nacion*.

A NEWLY FORMED MEXICAN FIRM, Celulose Nacional, soon will be producing cellulose from cotton seed. Backed by Banco Nacional de Mexico, Celanese Mexicana and Viscosa Mexicana, the project will also receive financial aid from the Mexican government through Nacional Financiera. Said to be one of a very few of its kind in the world, the plant will be located in Tamulipas State.

TIMBER RESEARCH LABORATORIES are being built at Kepong, Selangor State, Malaya, for experimentation on Malayan woods in the production of paper. Although Malayan secondary hardwoods have been considered for pulp for many years, this is the first actual attempt to carry out experiments. J. P. Edwards, acting director of forestry, has commented that hardwoods will have to be mixed with coniferous timber to produce pulp.

MODERNIZATION WHICH WILL ALLOW an increase in paperboard production will shortly be undertaken at The Karton-und Papperfabrik von Franz-Melnhof and Co., Fronnleiten in Styria, British zone of Austria, through the partial use of Marshall Plan funds. The E.C.A. will provide $580,000 of the $1,189,000 needed to finance the modernization program. A new cylinder paperboard machine will be purchased in the United States which will increase folding boxboard and container board output from 7500 tons to 19500 tons.

PAPER AND BOARD PRODUCTION in West Germany reached a new post war high of 150,000 tons in October, which was almost 6000 tons above September output. Paper and board exports, which had dropped to 4800 tons in September, rose to 5800 tons in October.

AS A MEMBER OF the Newsprint Rationing Committee in Britain, Bertram Jones, managing director of *News of the World*, London, will examine the newsprint supply position of Australia in a tour he is making of the country.

LUMBER INDUSTRY WASTE PRODUCTS will be utilized as raw material in a $12,000,000 newsprint mill now being planned for Chihuahua State, Mexico. Private investors and the Mexican government will supply equal amounts to finance the project.

POSSIBILITIES OF NEW PAPER MILL in Labrador's Lake Melville region are said to be under consideration by a group of New York financiers. It is believed that the group, which includes several newspaper publishers, is almost ready to begin timber negotiations.

AN ACUTE SHORTAGE OF NEWSPRINT will cut supplies to some English periodicals as much as 20 per cent this month; the reduction will be 10 per cent for small users. Since a 5 per cent cut in newsprint supplies took effect February 10, English newspapers have been smaller and more difficult to obtain.

Foreign Abstracts . . . . . .

Affinities of important dyes for pulp fibers

The general assumption has been that the retention of acid and basic dyestuffs is due to adsorption. Inasmuch as most adsorption processes follow the course of Freundlich's adsorption isotherm (*I*), a study has been made of validity of this hypothesis. Thus paper stocks were dyed with a representative of each group of the dyes. These were *"Cellulose Scarlet" (II)* (=Benzopurpurin), an acid dye, Rhodanine *(III)* (a basic dye) and Congo Red *(IV)* (representing the substantive dyestuffs).

The stock used was a mixture of 53% unbleached chemical and 47% mechanical pulp. Its total resin content was 1.36% and it held 6.1% ash (over 10% of which was silica due to water glass). The pulp was lightly beaten (22 degrees Schopper-Riegler) and mildly sized and was slightly acid ($pH = 4.5$). Thirty gram samples of this wet pulp (=2 grams oven-dry) were treated with gradually increasing amounts of the dye in aqueous solution. The mixture was well-stirred, and filtered after 0.5 hour, whereupon the dye in the filtrate was determined quantitatively.

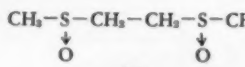
The fiber dye retention was then calculated, and curves drawn and compared with those of a typical *I*. The dyes (up to concentrations of about 10-12%) follow the course of the classical *I*. From that point on however, they veer away from *I* and flatten out. If however, the dye solution was allowed to react over long time periods (up to 30 hours at the highest dye concentrations) adsorption increases again, and the curve again coincides with that of *I*. Of the three dyes studied, *II* had the lowest affinity for fiber; *III* showed a greater affinity for the pulp, and naturally *IV* showed by far the highest affinity. This was especially manifested when chemical pulp free from ground-

wood was used as the adsorbant. (Tests with groundwood showed a much lower adsorption of *IV*, which however is still considerably higher than that of *II* or *III*). The curve of *IV* does not follow the classical curve of *I* because "pure" adsorption is not in evidence, when chemical pulp is used. It more nearly approaches *I*, when mechanical pulp is present (The latter presumably interferes with chemical bonding or combination between *IV* and the fiber).

Dye adsorption is a reversible process. When the concentration of the liquid suspension is lowered (by dilution) an appreciable amount of the dye sorbed on the fiber reenters solution. In practical dying of paper this would result in a marked loss in dyestuff, because dilution of the stock after beater dyeing is essential. However, in mill practice, this difficulty is overcome by using the (colored) white water from the fourdrinier for diluting the stock emanating from the beater. Six tables and three graphs are given. Karl Kletzl. *Wochblatt, Papierfabr.* 78, 337-8, 340, 342, 344, 1950, (In German).

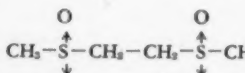
Sulphur Compounds in Sulphate Turpentine

In the course of a study of sulphate turpentine at the Norwegian Institute of Technology, various fractions were obtained. After the fractions had been standing several days, small deposits of crystals appeared in the alpha- and beta-pinene fractions, together with an oil. The latter was soluble in acetone, in which the crystals were very sparingly soluble. After recrystallization, they melted at 156-158°, and were shown to be identical with ethane 1, 2-bis (methlysulphoxide) (I).



(*I*)

On permanganate oxidation *I* gave the corresponding sulphone (*II*) melting at 190-1°.



(*II*)

II was also formed in some of the alpha pinene fractions. The presence of these products hitherto have not been reported in the literature; but only CH_3SH, $(CH_3)_2S$, and $CH_3S.SCH_3$. It is believed that *I and II* may originate from the (liquid) compound $CH_3.S.CH_2.CH_2.S.CH_3$ (*III*) (although their origin has not yet been verified experimentally. If III occurs in turpentine, it may be significant as an industrial hazard. All turpentines are known to cause eczema, and it is known that sulphate turpentines cause dermatitis to a greater extent than do other turpentines.

The malodorous lower boiling "foreruns" however, are not the offenders; they are less toxic than is ordinary gum turpentine. Hence the toxic principle is probably in the higher boiling fractions, and *III* bears a certain structural relationship to "mustard gas." At present (synthetic) *III* is being studied by the Dermatological Department of the University Hopital at Oslo. The possible genesis of III from carbohydrates and/or lignin is discussed briefly. Eleven references. Torger Bruun, Ewind Hafnor and N. A. Sörensen. *Svensk Papperstidn.* 53, No. 15, 440-41 (1950) (In English)

The situation in the French industry

The French paper industry is just emerging from a long period of stagnation resulting from the war and its effects.

During the occupation, paper produced in 1943 totaled only 329,155—a figure representing less than 33% of normal domestic consumption before the war.

Equipped to manufacture 1,600,000 tons of paper, the industry practically never has produced at full capacity. Even in the best years preceding the war, paper production reached only 90% of capacity. In recent years, France has been able to produce as much paper as she has (still only 75% of capacity), due to the following reasons: (1) her extensive utilization of domestic woods; (2) her stringent reclamation of wastepaper; and (3) a notable decrease in the quality of her paper products.

Immediately after the war, the revival of the industry was blocked by three factors: (a) the reduction in Scandinavian pulp production; (b) the relative increase in American imports of Scandinavian pulp; (c) the lack of efficient French planning. In 1947, only 897,000 tons of paper was produced—about 68 per cent of the mean prewar production. In 1948, wood received from Germany as reparations, allowed an increase to 1,136,000 tons. During 1949, the situation became somewhat more normal in both the quantity and the quality of the paper produced. In 1949, the production of 1,143,534 tons could be subdivided as follows:

Type of Paper	Production (tons)
Packaging papers	253,355
Newsprint and writing papers	561,852
Straw papers	51,060
Straw paperboard	37,886
Other paperboards	181,384
Specialties and fine papers	57,997

The consumption of newsprint by the French press dropped from a mean annual figure of 360,000 tons before the war to 220,000 tons in 1949. The financial status of French newspapers has grown desperate. The Paris press alone has lost two million readers. These conditions have rendered possible the allocation of some newsprint for export.

The table below shows the different trends in the types of pulps utilized by the paper industry since 1936.

The quality of French paper, although improving lately, still is far below the prewar standards. Now with the existence of freer international exchanges, it is imperative that France increase the quality of her paper and reduce the cost. If France is to enter the world market, her paper must be made to compete with Scandinavian products.

Pulp prices are the crucial element in the solution of this problem. Existing tariffs on pulp seriously threaten the efforts of the paper industry and the future of the industry depends upon its ability to solve this problem.

Unpublished article from *Extinfor* (Pages de France). By S. Beracha.

Recycling of Waste Liquor in The Sulphite Cook

After reviewing the rather scant literature in this field, the authors describe a method (based both on laboratory and pilot plant experiences) by which 40-50% of the undiluted sulphite waste liquor may be reused in a succeeding cook. The maximum temperature however, must not exceed 115 deg. When this is done, *no burned cooks* ever resulted (in some 30 experiments). Although the composition of the original liquors varied considerably, a satisfactory and useful composition was obtained with 0.6% lime and 9% sulphur dioxide.

With this acid it was possible to prepare a pulp with good strength properties with a relatively short cooking schedule, and a fairly high sugar content in the waste liquor; when the digestion was carried out without gas relief, the pressure was 130 psi. At present this pressure is not feasible in Swedish mills, but the industrial trend is to work at higher pressures. In general the experimental pulps obtained were quite comparable in quality with commercial pulps used in making greaseproof paper (excepting for somewhat lower folding endurance). They could (if necessary) be bleached quite readily to a G.E. brightness of 88%.

Seven cooks were made in a pilot plant (with recycling 40% waste liquor) in a 300 liter digester of stainless steel of the Schauffelberger circulating type. In this case a comparative study with a normal cook (without recycled waste liquor) and the sixth of a series of "recycled" cooks, showed relatively slight differences in yield and strength properties (although the Roe numbers varied considerably). In these pilot plant operations the liquor to wood ration was 4:1, and the liquor contained

Paper Production (in 1000 metric tons)

Period	Production of paper			Consumption of Pulps (in tonnages and percentages)			
	Total	Kraft portion	Mech. and Semichemical	Unbleached sulphite	Bleached pulps	Unbleached Kraft	Total*
Mean for 1936-1939	1.311	104	357 272%	274 209%	118 9.0%	104 7.9%	853 65.0%
1948	1.137	111	348 30.6%	142 12.5%	90 7.9%	147 12.9%	727 63.9%
1949	1.144	111	333 29.1%	180 15.8%	111 9.7%	143 12.8%	767 67.4%

(*) The remaining products entering into the total are wastepapers, rag, etc.

0.8% lime and only 3.8% sulphur dioxide. The color of the unbleached pulps showed negligible differences and the unbleached pulps could be readily bleached to 87-88% G.E. brightness. In the above cases, the cooking period (at 115°) was 10-10.5 hours, but this could be reduced to 7-8 hours by increasing the sulphur dioxide content of the liquor to 5.5% (and relieving at 5 kg./cm.^{2} pressure).

When waste liquor is recycled, the lime exists in part as the acetate, sulphate, lignosulphonate *et al*, all of which serve in buffering the liquor. All figures in % lime refer only to "bisulphite lime." However, the presence of other calcium salts in the liquor appears to have an effect similar to that of increasing the calcium base in a normal cooking liquor.

The object and techniques of recycling are quite fully discussed. The main objective of recycling is to obtain a more concentrated liquor either for evaporation or for the production of alcohol, or both. Hence, any waste liquor that is to enter the next stage should be undiluted, and the method for doing this is outlined, so that the liquor will contain about 20% total solids (and of these 55 grams sugar per liter).

One of the authors discusses at some length the heat economy effected by use of recycled liquors. In general the recycled liquor should give rise to marked fuel savings. For example if evaporation alone is resorted to, followed by burning, the fuel heat obtained with recycled liquor is about 50% more than with waste liquor from a normal sulphite cook. If, however, vacuum evaporation were used, the results would prove even more favorable.

When sulphite alcohol production alone is considered, the *yields* from a normal cooking liquor are about 15% higher than with a recycled liquor (because in the latter marked sugar losses occur). However, the cost of production per liter of the alcohol is greatly reduced. When *both* evaporation *and* alcohol manufacture are desired, there is also a very marked saving in fuel. Plant dimensions for processing recycled liquor are also far smaller than with normal waste sulphite liquors.

The authors have outlined the fuel savings, and have also tabulated fully the results of their calculations. 16 references are given. Erik Hägglund, Lennart Stockman, and Per Löfström. *Svensk Papperstidn.* 53, No. 18, 551-60 (1950) (In English).

Standard white

Standards (with nearly ideal properties) are described. Barium sulphate is precipitated with highly purified chemicals, under controlled conditions and mixed with a small amount of the purest possible gelatin, poured into chromium plated molds, and then compressed under a pressure of about 800 kg./sq. cm. When gelatin is omitted this pressure must be doubled, but such plates are sensitive and crumble easily. The average coefficient of reflection of such a barium sulphate plate is 0.991 ± 0.002 throughout the visible spectrum. Practically no "gloss" was observed. K. Miescher and R. Rometsch. *Experientia* 6, No. 8, 302-4 (1950) (Original in German, with an English summary).

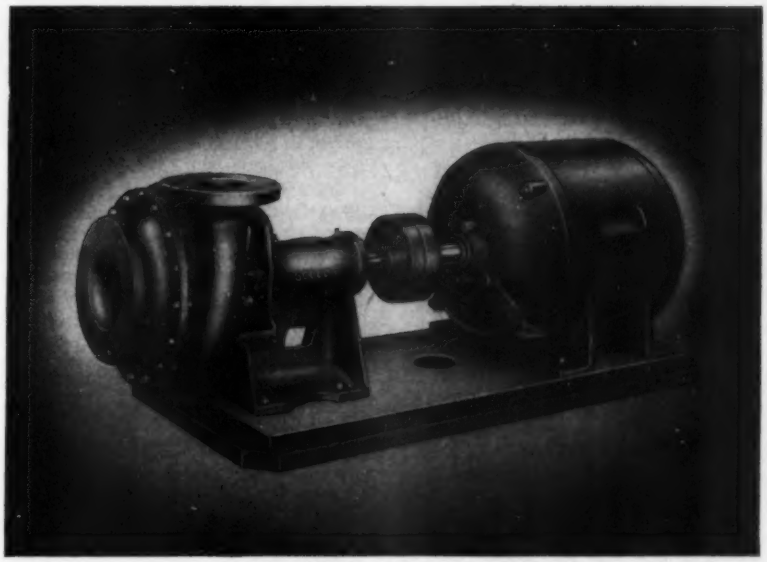


Fig. 3169 single stage, open impeller centrifugal

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Summary of NPA Regulations

ERIC G. LAGERLOEF,
Secretary, Materials Committee
American Paper and Pulp Association

▶▶▶ WITH THE EXPERIENCE of the last war still fresh in our minds, I am sure it is the hope of all of us that Government and industry work together. A good sign is the appointment of qualified industry men to responsible NPA positions.

Now, getting down to the business at hand, one question arises the answer to which affects all of us, and that is, "Has the essentiality of our industry been established with regards to the defense program?" My own personal opinion is that it has, though in World War II it wasn't until the middle of 1943 before official Washington suddenly came to the realization of how highly important the paper industry was. The fact that the Armed Services found over 700,000 uses for paper and paperboard surely establishes the importance of an industry such as ours. The number of items must have increased since so many new uses for paper have been developed over the past years.

In the last war, the committee work of trade associations was extremely important, and many industry executives gave unstintingly of their time serving on these committees in the interests of the whole industry. Such is the case again in this emergency, and I know you will be especially interested in one committee recently formed specifically to consider the status of various items needed in the manufacturing process of pulp and paper. This committee, the Critical Materials Committee, will determine the items that are or probably will be in short supply, and recommend to the staff and the Executive Committee of the American Paper and Pulp Association, ways and means of alleviating the situation, if possible. There is a general committee and a subcommittee each for metals, chemicals, textiles, and machinery and equipment. The over-all committee has already made two supply studies, namely on sulphur and fourdrinier machine wires, which were incorporated in a written statement submitted to the NPA. I am going to refer briefly to the wire study again, under the Copper Order, M-12.

The Critical Materials Committee, in order to do a good job, may find it necessary from time to time to send out questionnaires to the industry to determine fully what the supply and consumption picture is in one or several commodities. In order not to burden the industry, only such requests will be made as are deemed essential. Your cooperation and assistance in filling out these questionnaires will add greatly to the value of the finished study.

Government regulations at best do not make very clear reading and the experiences of the past week in reviewing the multiple NPA releases has left me with a definite feeling of inadequacy, but I have sorted and chosen a number of these orders which I hope will be of help to you.

NPA Regulation 1, issued September 18, 1950, listed materials which are to be kept to a "practicable working minimum", defining a practicable working minimum as "the smallest quantity of material from which a person can reasonably meet his deliveries or supply his services on the basis of his currently scheduled method and rate of operation". Three interpretations of this regulation have been issued. However, this formula remains the basic regulation for inventories of scarce materials.

NPA Regulation 2, issued October 3, 1950, sets the basic rules of the priorities system. This regulation provides for the assignment of a rating by authorized agencies to any commodity except those specifically included in list A.

Aluminum—M-5, first issued October 27, 1950, provides a sixty day lead time for acceptance of DO orders from producers and fabricators of aluminum forms and products.

M-7, first issued on November 13, 1950, was later amended on December 1st. The amendment supersedes M-7 as originally issued. This amendment limits the use of aluminum during December 1950 to 100 per cent of average monthly use in the base period of the first half of 1950, to 80 per cent in January 1951, 75 per cent during February and 65 per cent during March 1951. The order permits the use of aluminum for repair, maintenance and operating supplies at the same rate for such purposes as during the base period.

Chemicals—M-32, issued January 24, 1951, established the framework for scheduling of DO orders for chemicals. Specific quantity limitations and lead time for each chemical in Schedule A is to be set.

The NPA is planning to issue, on or about March 1st, an over-all chemical control order, patterned after M-300 of World War II and along M-32 lines, which provided for fair distribution of DO rated orders in the chemical industry. With each new chemical or chemical substance slated for fair distribution treatment, the NPA now has merely to append the name of the chemical, the limitation time for accepting rated orders and the lead time, if any.

Chlorine—M-31, issued January 23, 1951, limits DO orders. Producers and distributors must accept up to ten per cent of any month's production or receipts. Establishes a lead time of fifteen days for producers and twenty days for distributors. This order applies only to merchant chlorine.

Construction, M-4, as amended January 13, 1951, prohibits construction which does not further the defense effort or does not increase the nation's capacity for defense.

This order, as amended February 9, 1951, further limits construction, and defines and lists types of construction where NPA authorization is required. Printing establishment construction is specifically excluded.

Paper—M-36, issued February 8, 1951, carries the set-aside percentages for Government orders, as specified, by grades of paper and board. Tonnages varying according to grades must be set aside to fill DO orders as well as non-priority orders from twelve Government agencies. This order is similar to WPB M-241. This order will take between five and ten per cent of paper production.

Insofar as these orders apply to the industry and until such time as the NPA provides automatic priority assistance, I would suggest that you apply to NPA for any special priority aid to get necessary supplies of critical materials for MRO purposes. If you hold substantial quantities of rated orders, your chances of getting the needed priority assistance should be good.

To perhaps further clarify the many questions which no doubt yet exist in your minds, I have had distributed reprints of an article which appeared last week in The Journal of Commerce. Here you will find eighty-five questions and answers dealing with NPA inventory controls and the priorities system. I would like to bring to your special attention the section on imports under NPA inventory controls and the status of DO orders under "Extension," "Rejection," "Delivery," and "Production Equipment" under NPA Regulation 2.

Future NPA policy will probably tighten limitations so as to make materials and production facilities available largely for military and essential uses, and materials will be allocated only for the approved production and use programs. An over-all production control measure, a revision of the CMP of World War II, is expected to be in operation the first of July. This new CMP is to bring the various parts of the defense production program into one solid, unified effort. It will, as presently planned, control three basic metals—steel, copper and aluminum. Limitation orders will be issued, but they are not expected to be as severe as in World War II, because military orders are not expected to take more than twenty per cent of U. S. production, according to the latest press analyses.

Should the international situation become progressively more critical, then naturally a larger percentage of U. S. production will be diverted to war work. It is not only the direct armament needs which are drawing supplies away from the civilian economy. Stockpiling of critical items has been lagging, so that now there is a rush to catch up.

The latter development has caused many items such as tin, rubber, cotton, wool, lead, sulphur, etc. to skyrocket in the international markets because of competition between countries for available supplies. Undoubtedly, some of the "have" countries are reaping a rich harvest because of this competition. However, steps are being taken on an international scale to limit or stop "bidding up" of critically scarce raw mattrials. The United States, France and Great Britain are initiating formation of international boards, to be set up in the near future, which are to suggest ways to increase production and work out plans for allocating critical raw materials supplies among the western allies. In all, twenty to twenty-four countries have been invited to be represented on these boards. Six to eight panels

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Address delivered by Mr. Lagerloef at the meeting of Materials Committee, February 21, 1951.

are to be set up immediately to cover thirteen commodities, including those previously mentioned. Each panel will have about six members representing the major producers and consumers of the commodities it deals with.

Looking at the other side of the picture, should the international situation show very definite signs of easing, what then? One fact we can be sure of is that we are going to rearm, and stay rearmed for a protracted period. Once, however, immediate rearmament needs, both domestic and international, have reached a satisfactory level, then the civilian economy will come into the forefront once more. Here again, meeting civilian needs should take up all the slack of a conversion period. Signs of this could appear this year, though this is very doubtful because of our defense needs. Eighteen months though, should tell the story. Meanwhile, and I guess I needn't remind you of this fact, there will be plenty of problems for all industry.

Copper—M-11, first issued November 29, 1950, provides the rules by which rated orders for copper and copper base alloys are to be handled by producers and suppliers. This order provides set-aside percentages of 15 per cent for rated orders on copper mill products.

M-12, issued November 29, 1950, provides the rules for the use of copper and copper articles remaining after the requirements for national defense are satisfied. Forbids use of copper in some 300 products for decorative or non-functional uses after March 1st. Under this order, consumption for maintenance, repairs and operating purposes is permitted at 100 per cent of the consumption in the base period—the first half of 1950. Paper manufacturers can consume as maintenance, repair and operating supplies 100 per cent of their average monthly consumption during the base period. Through an appeal, wire manufacturers were able to procure for the first quarter of 1951 enough copper to assure full paper and board production.

Specifically referring to this order, I would like to mention here again the work of the Critical Materials Committee of the American Paper and Pulp Association. Working hand in hand with the Paper Mill Wire Cloth Manufacturers Association, a statement was prepared with respect to woven wire cloth requirements of the industry. This statement was presented on behalf of the industry to the NPA in order that they might have a complete picture of industry needs in reaching a decision.

Copper Scrap—M-16, issued December 11, 1950, and amended December 18, 1950, restricts the distribution of scrap copper to regular trade channels. Scrap dealers' inventories are limited to one-third of total deliveries in the first half of 1950.

Nickel—M-14, issued December 1, 1950, limits the use of primary nickel for non-defense purposes during the first quarter of 1951 to sixty-five per cent of average quarterly consumption in the first half of 1950. Use for maintenance, repair and operating supplies is permitted at one hundred per cent of average quarterly use for these purposes during the base period of the six months ending June 30, 1950. The order limits inventories in the hands of users to a thirty day supply or a practicable working minimum, whichever is less. Later amendments prohibit the use of nickel and nickel products in more than four hundred non-essential items, beginning March 1st.

Steel—M-1, issued October 12, 1950 and amended January 22, 1951, requires acceptance of DO rated orders, based on shipments during the base period of the first eight months of 1950. The order sets lead time for acceptance of DO orders and minimum mill quantities. Percentages of DO acceptances are based on individual steel items.

Steel Distributors—M-6, issued November 8, 1950 and amended December 15, 1950, directs producers to allocate steel to distributors in the United States and Canada, based on average monthly tonnages delivered in the base period from January 1, 1950 through September 30, 1950, within the framework of lead time provisions established.

Tin Plate and Terne Plate—M-24, issued January 27, 1951, restricts the use of tin plate and terne plate to the uses set forth in the order and specifies the maximum coating of tin and terne metal permitted in each case.

Zinc—M-9, issued November 16, 1950, limits the amount of DO orders for zinc. Producers must accept up to ten per cent of monthly production, and fabricators and dealers must accept up to fifteen per cent of their average monthly shipments during the first eight months of 1950 for zinc and zinc products.

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TAPPI Abstracts

Abstracts on these pages are from papers presented at the annual meeting of the Technical Association of the Pulp and Paper Industry held in New York City, February 19-22, 1951.

Commercial Sulphite Production Experience with Ammonia Base, by L. A. La Fond and W. F. Holzer, Crown Zellerbach Corp., Lebanon, Oregon, and Camas, Wash., respectively. (Acid Pulping Session)

Ammonia-base sulphite acid has successfully replaced dolomite base acid for the cooking of western woods at the Lebanon, Oregon, mill of Crown Zellerbach Corp. The conversion involved installation of equipment to convert anhydrous ammonia to a solution at 17% concentration, a means to meter ammonia into the Barker tower, and elimination of all copper alloys from the system. With instrumentation now installed the acid plant operation is very nearly automatic. One digester lining was worn out and was replaced with a type recommended for soluble-base acid. The second lining, almost new, is a conventional lining. It is performing satisfactorily, but is expected to give short life.

The combined SO_2 has been lowered from 1.30 to 0.85% with no harm to pulp quality other than color. Cooking is much more rapid so that the mill has been able to reduce digester temperature by 20 F. at the same cooking rate, or 10 F. with an increase of 15% pulp production. Screenings have been reduced by more than half due to better penetration of the base, and the screening operation speeded up by 25%. The pulp requires a little less beating, but otherwise behaves the same in paper manufacture. The pulp bleaches normally, and uses the same chlorine as dolomite pulp on basis of bleachability.

Pulp and paper quality have improved except for color. Bursting strength, tensile, and fold have increased while tear remained the same. Sizing of paper has improved.

Advantages have been increased pulp capacity, better pulp yields with decreased screenings, better pulp quality, more uniform and generally easier operation, and savings in operating chemicals and maintenance. Extra cost of ammonia has been offset by savings, and a vigorous slime growth controlled by slimicide chemicals.

The advantages of ammonia base are attributed primarily to its rapid penetration of wood and to its solubility. No evidence is available as to any difference in its reaction with lignin.

Chemical Reaction Equilibria in Calcium and Magnesium-Base Sulphite Recovery Systems, by Roy P. Whitney, Richard M. Elias and Malcolm N. May, Institute of Paper Chemistry, Appleton, Wis. (Acid Pulping Session)

Many sulphite pulp mills are considering possible systems of utilizing or disposing of spent sulphite liquor involving evaporation and burning. From the standpoint of recovery and reuse of inorganic chemicals in pulping, it is desirable that information be at hand regarding the chemical compounds which are formed in the recovery furnace, and regarding the effect of combustion conditions upon the extent to which each may be present. This paper presents the results of calculations of chemical reaction equilibria for many of the important reactions which may be involved in the combustion of calcium-base and magnesium-base spent sulphite liquor. The calculations have been based upon thermodynamic data for the several compounds of interest, compiled from the literation. They indicate the conditions under which the oxide, sulphide, or sulphate of calcium or magnesium might be expected to predominate, and suggest a possible explanation for the observed differences in composition of the ash from calcium-base and magnesium-base liquor combustion.

Spent Sulphite Liquor Studies—1. Program of the Sulphite Pulp Manufacturers' Research League, Inc., by Averill J. Wiley, Sulphite Pulp Manufacturers' League, Appleton, Wis. (Acid Pulping Session)

In 1939, fourteen pulp mills (twelve companies) using the calcium-base sulphite process in Wisconsin and Michigan organized the Sulphite Pulp Manufacturers' Research League for purpose of developing answers to the stream pollution problem. Much credit for success of the program is attributable to the time and effort devoted by the League's technical committee to careful delineation of research policy. This committee, with membership drawn from the technical directors of the pulp mills, averages more than 1000 man-hours of service annually in the League's interest.

Active, spent sulphite liquor research and development work of the League is carried forward through three channels: by its own research staff of fourteen, by working closely with numerous co-operating individuals and concerns, and through substantial research grants to universities and other technical centers.

Initially, all available ideas and processes were carefully abstracted and reviewed. Thorough laboratory evaluation followed wherever possible on likely ideas and in the first eleven years some fifty processes have received more or less detailed and serious consideration. A few have passed through laboratory and pilot stages into semi-commercial and full commercial trial.

Research activities include development of (1) processes utilizing the unmodified spent liquor or crude concentrates, (2) processes based on use of the lignin compounds and organic derivatives of lignin, (3) processes based on use of the wood sugars and their conversion products, and (4) recovery of pulping process values and other minor fractions.

Evaluated processes with most promise for commercial development to date include evaporation and burning of the liquor and production of torula yeast. Technical development of evaporation processes is well advanced and burning is also technically feasible. However, the over-all economics of burning the liquor are marginal at best. From the technical standpoint the yeast process is also well developed but the operations are high cost and must be balanced by sale of the yeast. Further expansion of yeast production facilities depend upon market development. A comprehensive program of university nutrition research is supported by the league to that end.

Uses of the liquor as a dust-laying agent and as a possible medium for soil base stabilization on unsurfaced and surfaced roads are being further developed.

Hydrogen Peroxide Bleaching of Chemical and Mechanical Pulps—New Developments and Process Applications, by R. L. McEwen, F. R. Sheldon, and D. H. Nelson, Buffalo Electro Chemical Co., Inc., Buffalo, N.Y. (Mechanical Pulping Session)

Disclosure of new developments in the hydrogen peroxide bleaching of chemical and mechanical pulps is made with particular reference to the former. Improved process applications permitting greater bleaching efficiency are presented.

The new high density (20 to 50%) peroxide methods include the continuous moderate temperature system for pulp crumbs and the semi-continuous cold steep bleaching process for crumbs, continuous webs, and cut sheets.

The mixed peroxide (H_2O_2 and Na_2O_2) chemical system for bleaching is discussed and data are presented which establish its high commercial efficiency.

Commercial and laboratory results on various peroxide processes are presented. Data are given on: (1) sulphite pulp bleaching in a single stage to 75 or 85 brightness and as one stage in a multistage system to reach the 85 to 90 brightness range, (2) kraft pulp alkaline peroxide extraction, and (3) kraft pulp bleaching and superbleaching in the final stage to the 80 to 90 brightness level.

At high brightness levels, minimum cellulose degradation resulting from selected peroxide-bleaching methods is contrasted with excessive fiber damage often obtained with conventional chlorine methods.

Data are also presented on the peroxide bleaching of semichemicals, chemigroundwoods, and groundwoods of various wood species. The bleaching of agricultural residues and flax pulp are also discussed.

Investigations in the mill and laboratory have revealed bleaching techniques which result in interesting pulp properties. These techniques have led to the development of several new commercial processes which may be applied economically for the peroxide bleaching of most all pulp types.

Peroxide Bleaching of Groundwood and Sulphite Pulps, by Richard A. Premo, Gould Paper Co., Lyons Falls, N.Y. (Mechanical Pulping Session)

Modernization of the Gould Paper Co. mill and the conversion of this mill from the manufacture of newsprint and similar low brightness papers, to the production of higher grades of papers, required facilities for bleaching both groundwood and sulphite pulp. Since peroxide bleaching was known to be applicable to both pulps, it was possible to install one bleachery in which both groundwood and sulphite pulp could be bleached to the desired brightness, either singly or in mixtures.

Installation of a modern peroxide bleachery was completed in March, 1950. The bleachery is designed to operate at medium consistency (12 to 15% moisture-free basis) and has a capacity for bleaching 100 tons of groundwood or 130 tons of groundwood-sulphite pulp mixtures, or 130 tons of sulphite pulp per day.

Automatic equipment for the continuous preparation of the peroxide bleaching solution is novel in this mill. In this system the bleaching solution is prepared at the required rate in a four compartment stainless steel mixing tank. Metered quantities of water, Epsom salt, sodium silicate, sodium peroxide, and sulphuric acid are added in the several compartments in the given sequence. The finished bleaching solution flows to a storage tank from which a proportioning pump delivers it to the bleaching process.

Groundwood and sulphite pulp enter the process through separate consistency regulators and pulp meters, and drop into a seal box. From the seal box the mixed stock is pumped to a thickener which increases the consistency from 1.5 to 12-15% moisture free consistency. The pulp mat is removed from the thickener cylinder by a high speed take-off roll, shredded and conveyed, first to a single-shaft mixer where steam is introduced, and then to a double-shaft mixer where steam is introduced, and then to a double-shaft mixer where the peroxide bleaching solution is mixed with the pulp. From the double-shaft mixer the stock drops into a retention tower where it is held for the proper bleaching period and then dropped into an agitated chest for neutralization of the residual peroxide and alkali with sulphur dioxide. The bleached and neutralized pulp is then delivered to the bleached stock storage chest.

Various ratios of groundwood and sulphite pulp have been bleached in the process. Initial brightness of 62.2 Photovolt have been increased to 70.5 using 1.6% sodium peroxide. Increases of 10 to 11 points have been obtained with 2.0% solium peroxide. For special furnishes, 100% sulphite pulp has been bleached from 55 to 57 to a brightness of 75 with 2% sodium peroxide.

The materials of construction for this process are not unusual to the paper industry and include stainless steel, tile, transite, steel and rubber-covered steel.

Installation of this peroxide bleachery has enabled the Gould Paper Co. to produce higher grade papers. The bleachery has been giving good performance since the start of operations about a year ago.

Color Removal of Process Waters, by J. H. Davidson, Minnesota and Ontario Paper Co., International Falls, Minn. (Mechanical Pulping Session)

Highly colored waters, as noted in TAPPI's monograph on "Industrial Water for Pulp, Paper and Paperboard Manufacture," are unsuitable for use as process water in the manufacture of bleached pulp and paper. In order to furnish a suitable water for its 200 ton per day bleach plant, the Minnesota and Ontario Paper Co. installed in its mill at International Falls, Minn., a 15,000,000 g.p.d. filtration plant to remove the color its Rainy River water

supply which has color ranging from 40 to 80 p.p.m.

This plant consists of two horizontal, concrete Permutit precipitators, each of which is 33 ft. 6 in. wide by 112 ft. long by 15 ft. 4 in. deep, and five concrete, gravity type filters, each filter being 24 ft. wide by 30 ft. long by 13 ft. deep, and a new filtration building to house the equipment. The raw water is chlorinated and then mixed with the treating chemicals in a baffled, mixing flume and introduced into the tops of the inner compartments of the precipitators through distributor flumes. As the water and chemicals pass downwardly through the inner compartments, agitators serve to effect an intimate mixing with the sludge and the development of a good floc.

At the bottom of the precipitators, the flow of water is reversed and it is filtered upwardly through a blanket of previously formed sludge, the height of which is kept between specified limits by blowing off sludge from the sludge concentrators at the same rate as new sludge is being formed. Since the sludge from highly colored waters is usually rather light and the temperature of the raw water falls as low as 34 F., during the winter, provision was made to feed as filter aids either activated silica or clay.

While both gave good flocs, the clay was found to give better results as the filter runs were about three times as long as when activated silica was used. The type of clay which was found to give the best results was the Proper Chemical Co.'s P-3 grade. Clay is fed only when necessary and there are periods when no filter aid is required. The dosages of alum and lime used vary somewhat but are roughly about 2¼ gpg of alum and ½ gpg of lime. The results are excellent, the color being reduced from the original 40 to 80 ppm down to 2 to 4 ppm in the filtered effluent which, of course, more than meets TAPPI's color tolerance for higher grade products.

Chemical costs are somewhat less than 1½ cents per 1000 gallons. The water from this treatment plant has met all expectations. Its purity, low color, and lack of turbidity make it excellent for use in the production of high brightness pulps and papers.

The Vibrotor Screen, by Sven Fahlgren, Bird Machine Co., So. Walpole, Mass. (Mechanical Pulping Session)

The Vibrotor screen is a relatively new screen in this country. Developed in Sweden, it is based on experiences from earlier JONSSON vibrating screens. The Vibrotor screen consists mainly of a rotating and vibrating drum placed in a vat. The drum supplied with stainless steel cut plates is supported in two yokes, the yokes in turn supported on spiral springs. The vibration of the screen drum is transferred through the two yokes from two off balanced shafts driven by two electrically synchronized motors or one motor with chain drive. A small 1 hp. motor rotates the drum.

The screen is an inward flow screen and can be operated with or without overflow. The accepted stock flows out through one of the cylinder trunnions. A strong shower inside the cylinder cleans the screen plate very thoroughly. The screen differs from the old type of rotary screens by a higher vibration frequency which gives the screen higher capacity and requires a minimum of power. It also makes it possible to operate the screen at very high consistencies. The floor space required is very small, approximately 25% of space required for the number of flat screens needed to handle the same capacity.

Effect of Recycling Spent Liquor in Semichemical Pulping, by E. L. Keller and J. N. McGovern, Forest Products Laboratory, Madison, Wis. (Mechanical Pulping Session)

A series of neutral sulphite semichemical digestions of quaking aspen was made in which the spent liquor from each digestion was collected and used in the next digestion after fortifying with additional cooking chemicals. All other digestion conditions were maintained constant. Approximately 85% of the total liquor in the digester at the end of the digestion was recovered, and 80% was reused. The specific gravity and total solids content of the spent liquor closely approached maximum or equilibrium values after ten cycles of reuse. The equilibrium values after 11 cycles were 212 grams per liter of total solids with 114 grams per liter of sulphated ash in comparison with 76 and 44 grams per liter, respectively, after the first cycle. The pulp yield increased from about 74 to 76% in reaching this equilibrium and the pulp brightness decreased from 51 to 47%. The lignin content of the pulps increased slightly but their strength properties did not change during the recycling process.

An Optical Projection Method for Measuring Fiber Length, by Thomas Fyfe, Eastman Kodak Co., Rochester, N.Y. (Microscopy Session)

The pulp and paper industry generally realizes at present that an optical or mechanical device is a basic requirement for estimating the fiber length distribution of a given sample. Several methods for measuring fiber length have been described in the literature but for various reasons none has been adopted as standard procedure. A method that has found continuous operation by the author for the routine measuring of fiber length in pulp shipments and paper mill slurries involves the use of a modified microprojector.

A box with black inside walls and closed on all sides but the viewing end contains the microprojector and measuring screen. The screen is about 28 in. from the microprojector. The field of view is 7 mm. in diameter to permit the measuring of extremely long fibers without having to fix reference points. Most of the steps in the method such as the selection and preparation of sample and slides are of standard fiber analytical technique but they are nevertheless explained in detail. Fiber length is measured by projecting the image of the straightened fibers onto a screen having a concentric scale in 0.5 mm. divisions calibrated for a magnification of 50X. The center or smallest circle of this scale is subdivided into 0.1 mm. by means of dots that radiate from the center of the circle in eight equally spaced spokes. The shortest fiber measured is 0.1 mm. in length. A fiber length frequency chart is prepared with 0.1 mm. groups from which results are computed. Results are reported in the form of a curve. Three different graphic methods for reporting results are discussed and the advantage of the cumulative type curve explained. The results of a statistical examination of the method are summarized by the following statements:

(1) A minimum of 400 fibers (two slides) must be measured in order to get a fiber length distribution that would be reproducible within 0.4 mm. at the 50% point.

(2) There was found to be a difference between operators in the measurement of short fibers: 0.1 to 0.5 mm. in length. More recent work indicates that this source of variability can be eliminated.

The Preservation of Baled Straw in Ricks, by C. W. White, Pacific Coast Borax Co., Cleveland, Ohio. (Fibrous Agricultural Residues Session)

A three year study of chemical preservation of straw has shown that borax, or cheaper forms of borate ores (Borascu) can give excellent results as well as practical results. One ton of Borascu applied over at least the two top tiers are effective on straw ricks exposed to weather. Straw may be preserved with less deterioration and consequently greater yield giving more consistent quality paper. Firm bales of straw with a minimum deterioration make easier and faster handling.

Dissolving Pulp from Bamboo, by M. H. Joglekar, Timber Market, Bhusval, India, and G. H. Nelson, Northern Regional Research Laboratory, Peoria, Ill. (Fibrous Agricultural Residues Session)

The findings in this investigation demonstrate that a highly satisfactory alpha pulp which may be utilized for dissolving purposes

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can be manufactured from bamboo through a series of chemical treatments consisting of acid prehydrolysis, sulphate digestion, and multi-stage bleaching.

By virtue of its chemical composition, i.e., high fractions of pentosans and silica, bamboo posed many difficulties in pulp purification when the conventional pulping procedures were employed as initial steps in alpha pulp preparation. Alkaline pulps (soda and sulphate) exhibited high residuals of the above-mentioned constituents which resisted removal in many of the wide array of methods established for pulp purification. The matter of pentosans suggests a strong similarity between the alkaline bamboo pulps and the alkaline pulps produced from our more common hardwoods.

Although low in residual pentosans, the bamboo sulphite pulps (prepared under carefully selected conditions) were found unsuitable for subsequent purification because of their highly degraded nature, high silica content, and inferior bleaching characteristics.

Acid prehydrolysis of bamboo was found to be highly effective in facilitating the removal of pentosans and silica in the subsequent sulphate digestion stage. Pulps produced in this manner were bleached to high brightness levels with ease and with low total consumption of chlorine (less than 4%) in two or three stages. Because of the high degree of purity secured in these pulps the conventional alpha treatment was unwarranted.

The suitability of sulphuric acid as the hydrolyzate and its re-use in the prehydrolysis of bamboo are discussed.

Excellent acetate syrups of low turbidity and clear films were prepared from the bleached, prehydrolyzed bamboo pulps.

Mechano-Chemical Process—Rate of Delignification, by S. I. Aronovsky and G. H. Nelson, Northern Regional Research Laboratory, Peoria, Ill. (Fibrous Agricultural Residues Session)

Pulping rate studies were made on wheat straw with soda, kraft, and neutral sulphite pulping chemicals at 73, 73, and 93 C., in a small open vessel fitted with a high-speed stirrer. The most rapid pulping rate occurred in the first five minutes. Delignification continued after this period but at a greatly retarded rate. About 55% of the lignin, 30% of the pentosans, and 85% of the ash, based on the amounts of these constituents present in the original straw, were removed in the first five minutes; at the end of one hour, the amounts removed were 70, 35, and 90%, respectively. At the same concentration, caustic soda and the kraft chemicals gave practically the same degree of delignification of straw; sodium sulphite was too mild a cooking agent to produce satisfactory pulp at the low temperatures used. Both the higher cooking chemical increased the rate of pulping, the change in concentration of chemical having the greater effect. Mechano-chemical pulping of commercial straw in a three foot Hydrapulper gave results in good agreement with those obtained with the small laboratory vessel. It is believed that the speed and efficiency of delignification in mechano-chemical pulping is due largely to the increase, by mechanical action, in the diffusion velocities of the active chemicals and reaction products into and out of the fibrous plant material.

Boxboard from Wheat Straw to Replace Wood Veneer in Wire-Bound Shipping Containers, by E. C. Lathrop, T. R. Naffziger, and Earl R. Stivers, Northern Regional Research Laboratory, Peoria Ill.

Wire-bound shipping containers annually use about 1.5 billion square feet of wood veneer in thicknesses of ⅛ to ¼ inch. The grades of wood veneer used for this purpose are meeting with increasing demands for other purposes at higher price levels. In order to stabilize this industry, the development of a container boxboard from wheat straw was undertaken. Cooperative research between the Northern Regional Research and Package Research Laboratories has resulted in a satisfactory solution of the problem. A wheat straw boxboard has been developed which shows performance in standard wire-bound shipping containers equal to wood veneer in respective thicknesses. The important steps in this development are discussed. Specifications for the shipping containers using the straw boxboard and of the board itself are presented. The process for manufacturing the board is described in some detail. Estimates for the capital cost of a plant to produce 123.5 tons of board per day are presented, together with approximate production costs. The estimated cost of production is $54.40 per ton. In competition with wood veneer at $110 per M board feet f.o.b. southern mills, straw boxboard can be manufactured at a price attractive to the box maker.

Agricultural Residue Pulps—Crotalaria Pulps, By A. J. Ernst, H. M. Sutcliffe, and S. I. Aronovsky, Northern Regional Research Laboratory, Peoria, Ill. (Fibrous Agricultural Residues Session)

Crotalaria is one of the more important leguminous crops grown on the sandy soils of southeastern United States for erosion control. The two most common varieties, *Crotalaria mucronata* and *Crotalaria spectabilis,* produce high yields of seed and up to ten tons of green or two tons of dry forage per acre.

A number of pulping trials were made on these stalks, using the neutral sulphite and kraft processes. Crotalaria required more cooking chemicals and generally longer cooking periods than are necessary to pulp wheat straw. Lower yields of pulp were obtained from Crotalaria than from wheat straw but the Crotalaria pulps were stronger, particularly in tear resistance and folding endurance. In general, the kraft process produced stronger pulp than the neutral sulphite process but the kraft pulp yields were lower.

These preliminary experiments indicate that, from a technological standpoint, Crotalaria has good possibilities as a raw material for pulp and paper manufacture. Economic considerations, however, will undoubtedly be the controlling factors in the possible utilization of Crotalaria for pulp and paper production.

The Sulfox Process for Recovery of Chemicals from Acid and Neutral Sulphite Waste Liquors, by R. S. Aries and Arthur Pollack, R. S. Aries and Associates, New York, N.Y. (Acid Pulping Session)

This new process provides for burning the waste liquor and recovering the inorganic chemicals. A soda base is used instead of the usual lime or dolomite base. After evaporating and burning the sodium sulphide in the ash is oxidized directly to sodium sulphite. Only standard equipment is used.

Correlation of B.O.D. and Chemical Tests on Industrial Effluents, by K. G. Chesley, R. W. White and R. V. Hogg, Jr., Crossett Paper Mills, Crossett, Ark. (Water Session)

Because of the length of time required to determine 5-day B.O.D. values, the possibility of calculating B.O.D. from oxygen consumed from permanganate and total solids values has been investigated. This study was made on the combined effluent from a kraft pulp and paper mill and a hardwood distillation plant. By the use of statistical techniques it was found that there is a significant correlation between B.O.D. and the other more rapid laboratory tests. The limits of accuracy for the calculated values were determined. With these established limits known it is possible to set up a control system that can be used with confidence.

Operation of the Bird-Gibbs Flotation Saveall, by J. E. Fitzgerald, Bird Machine Co., So. Walpole, Mass. (Water Session)

This machine is a development of the firm of F. S. Gibbs, Inc., in Boston. Basically the machine is intended for the clarification of paper mill waste water; that is, the removal of suspended solids. It is a high efficiency saveall operating on the flotation principle. There are three good reasons for its existence; namely, the widespread pollution of streams throughout the country, the appalling quantity of valuable stock that is now discarded in mill waste and the desire of mills to reuse water.

The waste water is chemically treated with automatic control ahead of the machine. Subsequently, mixing, flocculation, flotation of the solids, concentration in removal of the floated material and outflow of the clarified water take place in succession; all operations being integrated in a package unit. Flotation is induced by a pump set up outside the machine with its suction and discharge passing through the wall of the unit itself. This pump recirculates part of the clarified water. Installed in the suction line of the pump is a very special device through which the pump suction pulls a small amount of air from the atmosphere. This special assembly has the effect of breaking up the air passing through it into extremely fine bubbles, and intimately mixing them with the moving stream of water. This mixture is discharged within the main body of the unit. The tiny bubbles, in their upward passage, attach themselves to the suspended solids and carry them at quite a remarkable rate to the surface.

The first full-scale commercial installation of this unit is now in operation in a mill in Northern Massachusetts. Pilot plant operations are being conducted in several other mills.

Scott Paper Co. Waste Disposal Plant, by D. R. Wadleigh and L. G. Simons, Scott Paper Co., Chester, Pa. and Chas. T. Main, Inc., Boston, Mass. (Water Session)

Events leading toward installation of a waste water disposal plant at the Chester, Pa., plant of Scott Paper Co. are covered to show how the present plant was determined. Preliminary to filing plans with the State Authorities for a complete treatment plant for waste waters discharged into the Delaware River, the Scott Paper Co. conducted tests on a standard full-size precoat-type filter to obtain sufficient data for the design of a waste water disposal plant. Tests showed for example that the capacity of a Waco filter operating at top speed on paper machine white water having a fiber content of 8 lb. per thousand gallons was 600 gpm, but the capacity increased to 1400 gpm when operating on lean waste water at 1.5 lb. per thousand gallons. Using the test results as a guide, a complete waste water disposal plant was designed and built using Waco filters, and including a novel water collection system. The plant operation is completely automatic with a recovery of over 90 per cent of the incoming fiber. The collection system consists of an elevated open flume which receives white water from numerous pipe lines fed by individual pumps. The flume conveys the water to a 100,000-gallon collector tank which serves to even out surges. Paper machine furnish is used for precoat and together with the recovered fiber is returned for utilization in the papermaking process. Actual operating records during the first 6 months show that filter performance has lived up to predictions based upon pilot plant studies.

Experimental Chemical Treatments for Kraft Mill Waste, by William Moggio, National Council for Stream Improvement, New York, N.Y. (Water Session)

A review and description of the experimental chemical processes for the treatment of kraft mill wastes for removal of color and oxygen-consuming materials. The greatest disadvantage of all processes to date has been the excessive cost of treatment coupled with the problem of handling and disposal of large quantities of sludge produced. This probably accounts for the fact that none of the processes, with one exception, have gone beyond the laboratory stage.

A chemical treatment process presently under study and development is described. The process involves the use of excess lime and carbonation followed by the recovery of the lime in the precipitated sludge. With the recovery of the chemicals this process shows promise of successful economic application. Methods of control and the development of an easily dewatered sludge are considered essential to success.

Rate of Beating of Prerefined Kraft Pulps, by H. Wyatt Johnston and W. C. Lodge, Sutherland Refiner Corp., Montreal, P.Q. and Pulp and Paper Research Institute of Canada, Montreal, P.Q. (Alkaline Pulping Session)

Data are presented on laboratory beater tests of moist southern unbleached kraft pulp and the same pulp subjected to varied degrees of refiner treatment before beating.

Data are presented on laboratory beater tests of the same series of pulps that had been sheeted, dried, and stored before beating.

The maximum strength that can be developed by beater treatment is somewhat lower in the refined pulps than in the untreated pulp, whether they are dried or not before beating. The loss of ultimate strength tends to vary with the degrees of refining.

The average moist refined pulp is beaten to 450 freeness or 60 burst factor in approximately half the time required to beat the untreated pulp to the same degree.

The rate of strength development of both treated and untreated pulp is reduced by drying but the relative difference between the two types is substantially maintained.

Prerefined dried pulp may be beaten to a given strength (60 burst factor) or freeness (450 Canadian Standard) in slightly less time than the untreated moist pulp.

Prerefining appears to be of interest as a means of increasing beater room capacity.

Further Studies on the Alkaline Pulping of Scrub Oak, by C. W. Rothrock, Jr., and W. J. Nolan, University of Florida, Gainesville, Fla. (Alkaline Pulping Session)

The effect of per cent sulphidity in the alkaline cooking liquor on the pulping of scrub oak *(Quercus laevis)* has been studied. Per cent sulphidity (grams Na_2O expressed as Na_2O per 100 grams total alkali expressed as Na_2O) was varied from zero to 100 per cent. Maximum strengths of pulps were found to result when sulphidity was held in the range of 30 to 45 per cent. At sulphidities lower than 25 per cent, pulp strength increased with cooking time. At 25 per cent, strength of pulps cooked 1.5 and 3.5 hours total cooking time were about equal. Above 25 per cent sulphidity, pulp strength decreased with cooking time.

The easiest bleaching pulps were obtained in the same range of sulphidity as produced the highest strengths. Pulps with 46 per cent yield and a single stage bleach requirement of 6.0 per cent (75 per cent G.E. brightness) were obtained in the range of 25 to 45 per cent sulphidity. Permanganate numbers of pulps are presented but no correlation between permanganate number and bleachability could be found.

Addition of black liquor to the white liquor before pulping was found to greatly reduce the titratable suphide in the cooking liquor. The same effect of high per cent screenings was found to result in pulps to which black liquor had been added as were obtained when low per cent sulphidity was used in the white liquor.

The best quality of scrub oak pulps, from a strength and bleachability standpoint, were found to result when 16 per cent chemical, 35 grams per liter, and 30 to 45 per cent sulphidity were used. Cooking pressure was 115 psig, 1 hour to maximum temperature and 2 to 2.5 hours at temperature. Such pulps are well suited for use as filler or "soda" pulp.

Redwood As a Potential Source of Pulp, by Harry F. Lewis, Institute of Paper Chemistry, Appleton, Wis. (Alkaline Pulping Session)

This paper summarizes a large amount of pulping research which has been carried out on virgin and second-growth redwood at The Institute of Paper Chemistry. It covers the amount, distribution and nature of available redwood material, and the physical properties and chemical composition of the two types of wood. Experimental results of pulping by sulphite, sulphate, nitric acid, Asplund, and Masonite processes are discussed in some detail and possible uses of the resultant pulps summarized. A sizable amount of second-growth redwood is becoming available, and this material is potentially of interest as a raw material for pulping by the sulphate process. In addition woods waste and mill waste redwood can be converted by the Asplund process into highly desirable pulp for use in roofing felts and for other similar papers. Virgin redwood can be reduced by the sulphate process to give a satisfactory grade of bleached pulp; because of low yields such an operation is not currently attractive. Second-growth wood yields a strong bleached kraft pulp in good yield.

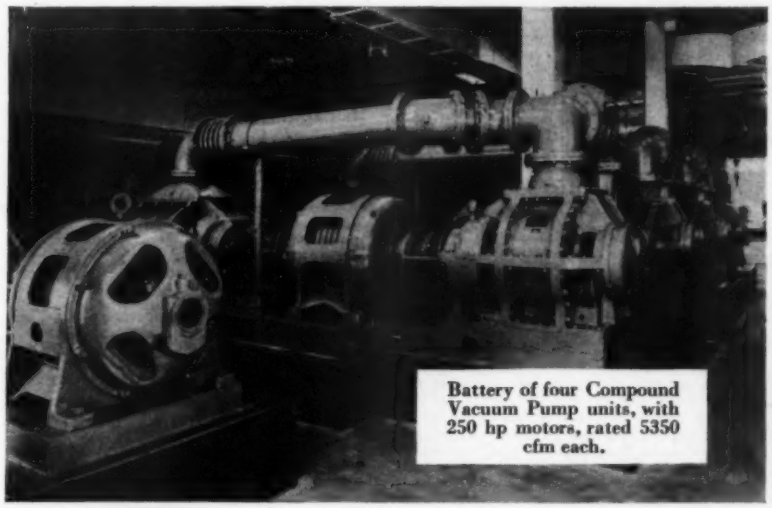
Some Factors in the Color Reversion of Bleached Secondary Fiber, by H. P. Bailey, J. J. Forsythe and E. F. Andrews, International Paper Co., Niagara Falls, N.Y. (Alkaline Pulping Session)

Secondary fiber obtained by deinking of waste paper tends to revert in color after bleaching. A number of factors involved in deinking and bleaching waste magazine stock were studied in the laboratory to determine their effect on color reversion.

Experiments with three different deinking agents showed that, in general, there was the least color reversion with peroxide, and the most with sodium hydroxide, with sodium carbonate being intermediate. Up to deinking temperatures of 160 F. an increase in temperature resulted in less color reversion; a further raise in temperature above 160 F. brought about slightly greater reversion.

In the bleaching operation, experiments were made in varying total chlorine, chlorine in the chlorination stage, and the hypochlorate. Increase of total chlorine and of the final brightness of the bleached stock gave less color reversion.

Buffered bleaching or high alkalinity in the hypochlorite stage gave higher brightnesses and less color reversion. It was found, under the experimental conditions observed, that hypochlorite bleaching at 110 F. produced the highest brightness with greatest color reversion; that



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140 F. gave the lowest brightness with least color reversion, and that 80 F. showed intermediate results.

The use of 1 per cent caustic extraction stage decreased the loss of color. No further benefit was found in the use of over 1 per cent caustic. Where peroxide was employed as an additional stage for final brightening, less color reversion was experienced.

Odor Elimination in a Sulphate Pulp Mill, by P. Ghisoni, G. Bozza and P. Colombo, Vita Mayer & Co., Milano, Italy. (Alkaline Pulp Session)

Referring to a previous paper, in which the same authors have studied the possibilities of odor elimination through burning of gases in furnace, oxidation of combusted gases and effluents, and dispersion of smoke through a stack of considerable height, the practical results obtained after a year of application are discussed and criticized. In conclusion it is stated that it is possible to burn all the incondensed gasses from digester relief and from the blow tanks in a normal furnace, providing that the velocity in the pipe be more than a certain limit value, that the gases be mixed with enough air to have a concentration below the explosive limit, that a good antiflame filter be provided before the inlet in furnace. Each device is in itself sufficient to prevent trouble, but the three together will give an absolute security of success. Oxidation of odorous effluents, using the effluents of the bleaching plant, gave very good results: on the contrary, oxidation of gases was found not necessary because the stack height is sufficient to guarantee dispersion below odorability limit (from 2 to 4 miles), according to the theoretical results obtained with the Sutton formula. The limit of 4 miles is sufficient to prevent settling of the fumes before dispersion and for this reason only seldom, and always in a very limited degree, odors are detected in this area.

Preservation of Fiber Insulating Board with Copper Pentachlorophenate, by E. A. Behr and A. J. Hubert, Jr., A. D. Chapman Co., Memphis, Tenn. (Structural Fibrous Materials Session)

Fiber insulating board is subject to attack by fungi and insects but copper pentachlorophenate has demonstrated good preservation power. Since fiber insulating board mills are now using this compound for large scale treatment of their product and more promise to be, investigation on the variables affecting retention was undertaken.

Copper sulphate, sodium pentachlorophenate (technical), wax sizing, and alum were added to a variety of board stocks, including aspen groundwood, southern yellow pine groundwood, Douglas-fir and western hemlock Asplund mixture, waste paper, and southern yellow pine Asplund pulp. Boards were analyzed for copper and chlorinated phenols. The most important variables affecting retention are *p*H of the pulp chemical mixture and order of addition of reactants. The *p*H must be kept above 5.2 or low retentions result. If resin sizing is added before the sodium pentachlorophenate and copper sulphate, copper resinate may form, and alum must be added last or sodium pentachlorophenate will precipitate. Only stoichiometrical quantities of reactants are needed. Retentions of at least 95 per cent based on the theoretical retention resulted when the above variables were controlled.

There are two ways to effect addition of copper pentachlorophenate, the "internal" method in which reactants are added directly to the pulp slurry at an opportune point in the board manufacturing process and the "external" method in which the copper pentachlorophenate is formed in an external reaction vessel and added to the pulp as a suspension. Retentions are equally good with either method.

The recommended retention of copper pentachlorophenate to give good protection to the insulating board of 0.4 per cent by weight. To achieve this retention, based on laboratory work, it would require 10.14 lb. of sodium pentachlorophenate (technical), and 3.94 lb. of copper sulphate penta hydrate to treat a ton of dry pulp.

The Bonding Strength of Certain Adhesives on Liner Board, by Geoffrey Broughton and Ernest R. Kaswell, Fabric Research Laboratories, Boston, Mass. (Plastics Session)

The Instron tensile tester, which is a constant rate of elongation electronic recording instrument, offers a new tool for the study of adhesive bonding. It has been applied to the study of corrugated board adhesion, opposite sides of the bond being placed between the opposite jaws of the tester. Amplified load-extension diagrams for silicate and starch adhesives are given and show strength as well as variability of the bond. The method has also been employed to study glue, starch, and silicate adhesives applied to uncorrugated liner board.

The Properties of a New Vinyl Chloride—Vinylidene Chloride Latex for Paper Coating, by E. K. Stilbert and H. L. Clack, Dow Chemical Co., Midland, Mich. (Plastics Session)

A new vinyl chloride—vinylidene chloride latex is described. The properties of this synthetic latex are outlined. Detailed information is presented on the methods of handling and formulating the latex to obtain useful decorative and protective coatings. Data on the properties of coated papers are presented which indicate that this latex will find wide use as a general purpose, vinyl resin coating material.

A review of the vinyl chloride—vinylidene chloride copolymer system shows that a latex based on a high proportion of vinyl chloride in the copolymer deposits films with excellent color stability, toughness, grease, water and chemical resistance. It can be formulated to obtain a fair degree of moisture vapor resistance. Such a latex is being made commercially under the name, Dow Latex 744-B.

This new vinyl copolymer latex possesses excellent mechanical stability. It is widely compatible with water soluble and water dispersible materials. Since it does not form a film with simple air drying, special formulating steps are required to obtain useful films. Due to the excellent stability of the latex and compatibility of the polymer, excellent films can be obtained by using a wide variety of modifiers incorporated with standard mixing equipment.

The Properties of High Yield Kraft Pulps Produced at Bathurst, by J. McK. Limerick, Bathurst Power and Paper Co., Ltd., Bathurst, N.B. (Alkaline Pulping Session)

In a constant effort to conserve natural resources and at the same time obtain more production from a given quantity of wood, the Bathurst Power and Paper Co. have increased kraft pulp yields at 62 per cent on a regular commercial basis. This has been largely brought about by brown stock refining according to the Sutherland high yield process which refines the pulp while still in the presence of hot black liquor after the blow tank and before the brown stock washers. The pulping process from the digesters to the machine room is described.

High yield kraft pulps representing current operating practice for linerboard with a yield of 62 per cent and chlorine number of 16.2, and also pulp from a trial run of 64 per cent yield and 19.2 chlorine number have been completely evaluated. They have also been compared with commercial pulp not produced by brown stock refining having a yield of 47 per cent and chlorine number 2.9.

The high yield pulps were bleached in the laboratory (Bathurst does not bleach commercially) and produced bleached pulps at over 50 per cent yield from the wood. The evaluations compared very favorably with a commercially bleached pulp.

Chemical analyses were done on all unbleached and bleached pulps.

High yield kraft pulps produced at Bathurst have high initial strength (due to brown stock refining). As the roughness increases they require more refining to bring them to a given freeness. The strength at any freeness compares very will with pulps of lower yield and good grades of kraft linerboard are being made from the pulp.

Summary of TAPPI Strength Tests

At Zero Beating Time				At 450 Freeness		
Chlorine No.	2.9	16.2	19.2	2.9	16.2	19.2
Freeness	681	718	717	450	450	450
Time to freeness	0	0	0	49	69	116
Burst factor	32.1	36.1	69.6	94.4	90	98
Tear factor	250	155	128	113	88.5	89
Breaking length	7100	6120	9460	14600	12000	13100

Convention Papers . . . Abridged

Production of neutral semi-chemical sulphite for high grade book paper*

L. W. MURTFELDT
Pulp Superintendent
Consolidated Water Power and Paper Co.

For many years, the paper industry has been interested in new processes, or in the improvement of old ones to provide strong papermaking fibers from hardwoods.

In the Lake States, as in other parts of the country, desirable spruce and balsam fir is becoming scarce and costly. This situation has caused mills in the area to become dependent upon other areas for their wood or pulp supply. Primarily it was the cause of our interest in neutral sodium semichemical pulp for book and magazine papers.

The Forest Products Laboratory has broadened its original work on neutral sodium semichemical for boxmaking grades, by lower yield cooking and bleaching experiments, to the production of high brightness pulps with unusual strength characteristics. This excellent work is fully reported in the literature.

The Solvay Process Co. carried on another phase of the work by producing 70% yield semichemical from black gum wood and bleaching it by a three-stage process. The report of this work and sugested design for liquor making is very helpful to anyone attempting to lay out a semichemical plant.

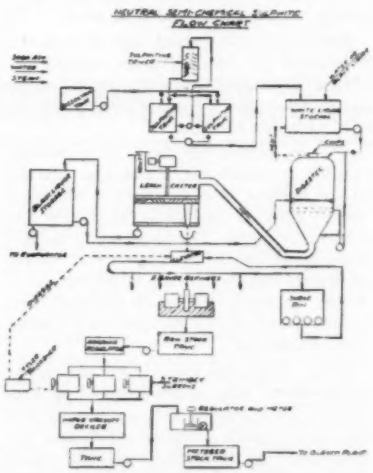
Since bleachable neutral semichemical sulphite was not being produced commercially and trials of the pulp on a papermachine were needed, 60 to 70 tons of poplar pulp were cooked and lapped at Marathon Corp.'s chemical division. The pulp was bleached at Wisconsin Rapids and run in various furnishes to gain preliminary knowledge of its effects upon paper quality and machine operation.

Results were encouraging enough to warrant the building of a 20-ton per day semi-commercial plant, using a 2300 cu. ft. vertical digester for cooking. Other equipment consisted of a soda ash dissolving tank, one sulphiting tank and tower, liquor storage tank, one leach caster and blow pit, one Bauer refiner, one rotary screen, several deckers, and a stock tank.

Poplar was cooked to a 70% yield; for nearly a year the pulp was used as unbleached in certain furnishes which, during the war, were not critical for brightness.

The next step in the program was to bleach the neutral sulphite pulp so larger amounts could be used. To avoid building a bleach plant until more experience and knowledge had been attained, our three-stage (chlorine-caustic-hypo) sulphite bleach plant was converted to a two-stage plant. The caustic stage equipment was used to single stage bleach the neutral sulphite to a 70 G.E. brightness. This stage was an oxidation bleach, using 9 to 10% chlorine as calcium or sodium hypochlorite, highly buffered with caustic and sodium silicate. The resulting pulp, though only semi-bleached, was very clean. Its shrinkage was less than 5% on an unbleached basis. Its strength characteristics were about the same as the unbleached pulp strengths; and its brightness served our immediate requirements.

Steps were then taken to increase the size of the unbleached pulp plant to 75 B.D. tons per 24 hours. A description of the present plant is as follows (See flow chart).



Liquor Plant. Soda ash is unloaded from hopper bottom cars by conveyor to a storage bin. A screw conveyor and belt conveyor handle soda ash as required over a Fairbanks-Morse scale to a steel dissolving tank. Soda ash dissolved in 60 C. water is pumped to one of two steel sulphiting tanks. A circulating pump furnishes the solution to a wood-stave absorption tower packed with ceramic rings. SO_2 at 18½% is blown into the bottom of the tower, furnished from our

(*) Abridged from a paper presented before the 31st annual convention of The American Pulp and Paper Mill Superintendents Association, held at the Edgewater Beach hotel, June 8-10, 1950.

Strength Comparisons of Various Pulps

	Initial Mullen	5 Min. Mullen	Mullen at 400 Freeness	Initial Tear	5 Min. Tear	Tear at 400 Freeness	C. S. Freeness	C. E. Brightness
Unbl. Hem.-Balsam (40-60)	61	....	....	1.65	....	....	690	53
Unbl. Hemlock	....	82	125	....	1.52	1.15	675	42
Unbl. Balsam	....	105	140	....	1.37	1.02	665	60
Unbl. S. C. Poplar	125	....	....	1.10	....	....	420	48
Bleached Sulphite	55	80	137	1.85	1.60	1.15	670	82
Bleached Acid Poplar	35	....	....	.70	....	....	500	82
Semi-Bleached S. C. Poplar	120	....	....	1.05	....	....	400	70
Bleached S. C. Poplar	100	150	....	1.30	1.16	....	350	83
Bleached Blend-Sulphite & S. C. Poplar	70	100	125	1.60	1.35	1.20	620	83

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sulphite gas producing system. The reaction is stopped when the required ratio of sodium sulphite to sodium bicarbonate is reached. The strong white liquor is pumped to a steel storage tank. This tank serves for dilution and heat recovery as well as for furnish of hot cooking liquor to the digesters.

Digesters—Two of our eight sulphite digesters are converted to semichemical sulphite service.

The original 10 ft. x 45 ft. digester, and also a 16 ft. x 48 ft. vertical, Manitowoc-type digester, are used. The strainers of both digesters are located just above the bottom cones. A 1000 gpm. pump circulates liquor through the smaller digester; a 2500 gpm. pump performs the same job for the larger vessel. A full cone spray nozzle distributes liquor uniformly at the top of each digester.

The larger digester is equipped with two 350 gpm. black liquor nozzles located tangentially above the strainer. A high pressure pump furnishes black liquor to these nozzles to fill the digester before blowing and to aid in the blow.

Thoroughly cleaned and seasoned poplar chips are charged to the digester, and white liquor is pumped in to provide about 18% of total chemicals as soda ash. Dilution is regulated to assure a 50% liquor charge by volume to the vessel. A smooth cooking curve is used, allowing ample penetration time to 115 C. and then going to 175 C. maximum at 110 psi. Total time, cover to cover, is about eight hours.

Steam is vented to the liquor tank after cooking is complete, and hot black liquor is pumped in. The blow starts at approximately 50 psi. Successful blowing depends upon such factors as degree of chip packing, liquor level, steaming rate, and blow valve size. Each mill will have a problem in arriving at satisfactory blows, but our conviction is that regular vertical digesters can be blown with only occasional hang ups.

Each digester blows into a separate wood-stave pit with a strainer bottom. One tank, the larger of the two, is a regular sulphite blow pit, converted to semichemical use. Black liquor is held with the chips to level the charge in the pit, and then is drained to black liquor tank. A rotary plow removes the chips to the conveyor system for furnish to the refiners, the excess going to a Hofft surge tank of 4000 cu. ft. capacity.

Refiner Plant—Five double-disc Bauer refiners of 300 hp. each, break down the softened 70% yield chips into individual fibers. The installation consists of a Model 185 pulper and four Model 410 heavy-duty pulpers with water-cooled bases. Chips are metered to the refiners by direct-current driven screws from a Link Belt Bulk-Flo conveyor. The Hofft surge bin can return chips to the refiners at any rate desired.

The refiners are operated at a production rate of about 20 B.D. tons per day each. Some oversize material is allowed to pass through them. The quantity depends upon the ability of the screens to remove, thus providing a clean acceptable stock, and maintaining a reasonably high freeness.

An Askania regulator maintains a constant consistency to three Trimbey screens, where either single- or double-stage screening can be done. Rejects are thickened to 3% on a high-speed Tyler screen. They then are pumped to one Bauer refiner for complete defibering or are taken for special uses.

Accepted stock is thickened on an 8 ft. x 16 ft. Impco vacuum decker with couch roll take-off. Stock then is regulated to 3% with a DeZurik regulator and metered into a tank with an Impco positive displacement rotor. The speed of the rotor is regulated from decker tank level by a level gauge and rheostat.

Pulp is dropped to an agitator-equipped tank, converted from a former blow pit, and pumped to the bleach plant as required.

Bleaching—In the fall of 1949, higher brightness pulp was required, and the entire three-stage bleach plant was needed for sulphite. At present, operations follow an unorthodox but satisfactory procedure by bleaching a blend of neutral semichemical sulphite and acid sulphite. Regulated semichemical and sulphite are pumped through separate stock rotometers, which are tied together for proportioning in any ratio desired. This equipment was furnished by the Fischer-Porter Co.

The proportioned unbleached stock is mixed and washed on an Impco vacuum washer, and next is pumped at 3½% to 4% to six chlorination cells. The stock then follows through a standard batch process with acid wash—1½% caustic—caustic wash—calcium hypochlorite, and final wash.

Bleach plant operation and control has been good. The blended pulps, though dissimilar in chlorine demand, seem to utilize the chlorine each requires, without undue over or under bleaching.

This procedure has been an expedient, satisfactory under our conditions, but we would hesitate to recommend it to others where different conditions may give unsatisfactory results. The bleach plant changes were made on a full scale after specific laboratory bleaches to assimilate the plant. As yet, no exploratory work has been done on the bleaching of blended pulps under other conditions.

Pulp Characteristics—The unbleached semichemical pulp is characterized by high mullen, high tensile, and medium to low tear as compared to spruce or balsam sulphite. A high hemicellulose content causes rapid hydration when beaten. For many purposes the pulp can be considered prehydrated with many of the characteristics of sulphite at the same degree of development.

The unbleached and single-stage oxidation bleached fibers are quite straight, and form a stiff sheet as compared to sulphite.

The fully bleached pulp is much higher in mullen, tear, and tensile, and the fibers are more flexible.

The accompanying table shows the general relationship in strength between unbleached and bleached acid sulphite and neutral semichemical sulphite.

Discussion—There seems to be no doubt that neutral semichemical sulphite made from poplar is a strong, clean, high grade pulp. Its drainage characteristics lying between groundwood and sulphite, its "prehydrated" qualities and its ability to form well with other fibers make it a new and useful ingredient for many paper furnishes.

There are limitations to its use, as there are to all pulps used in papermaking. The determination of these limits by each mill, paper machine, and paper grade by actual trial is, of course, essential.

In order to fulfill its main purpose, that of conserving spruce, balsam, and hemlock by the use of the available and quick growing poplar, neutral sulphite must mainly replace long fibered pulps in paper furnishes.

We hope for substantial savings of the scarce and costly species while constantly maintaining or improving paper quality.

The production and refining of semichemical pulp for corrugating board*

J. E. SAPP
Chemical Engineer
Gaylord Container Corp.

The production of pulps for corrugating board by means of semichemical processes has undergone a very large expansion during the past several years. This expansion has paralleled the expansion in corrugated box manufacturing facilities, but it has been influenced by a number of other factors, primarily:

(1) Semichemical processes are economical in that only small quantities of chemical are consumed and high yields are obtained.

(2) High quality corrugating boards can be made from semichemical pulps.

(3) Hardwoods can be utilized satisfactorily in this manner, thereby decreasing the drain on the scarcer softwood supply and aiding in scientific forest management.

Thus far the most reliable method of evaluating corrugating board has been to run it on a commercial corrugator and test the finished board.

It is the purpose of this article to discuss some of the aspects of the manufacture of semichemical pulp for corrugating board, basing the discussion on data obtained in actual operation and mill scale experiments during the past several years in the mill and box plants of the Gaylord Container Corp.

Wood preparation—For a number of years the semichemical pulp produced at Bogalusa was made from pine sawmill waste. Following the closing of the sawmill, unbarked pine pulpwood was used and, more recently, both barked and unbarked pine, mixed oaks[1], and mixed gums[2] have been used. The wood has been chipped by means of a hog followed by a hammermill shredder and also by means of a conventional disc chipper. The hog and shredder combination has been used with the unbarked pulpwood and sawmill waste; the chipper, with the barked pulpwood.

The variety of experience gained in preparing the chips for semichemical pulping in this manner has led to two conclusions:

1. Even though chips containing more dirt, bark, etc., can be used in making pulp for corrugating board than for finer grades of paper, the most efficient operation and

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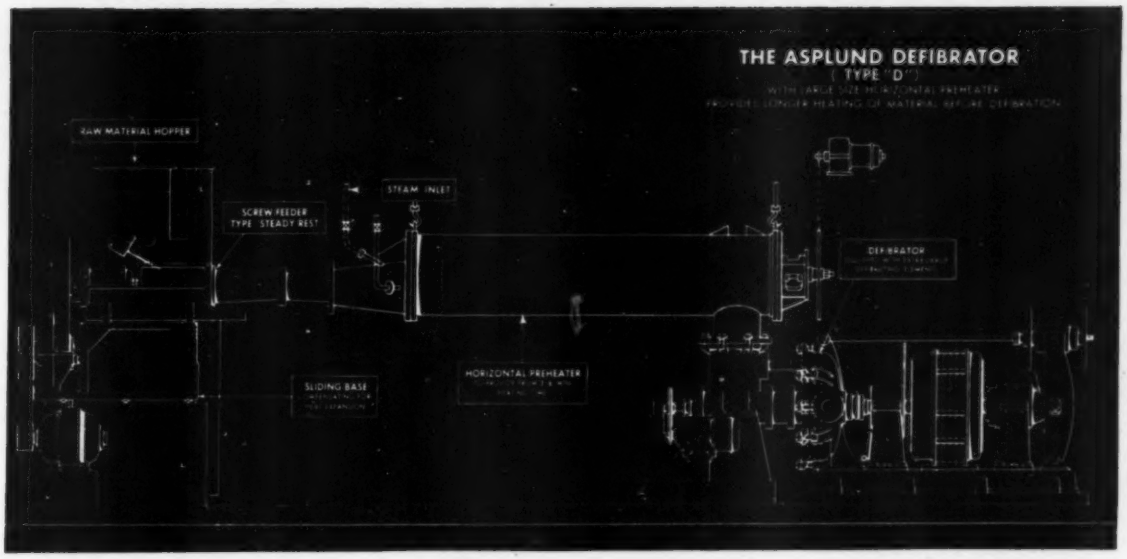
(*) Abridged from a paper read before the 31st annual convention of The American Pulp and Paper Mill Superintendents Association, held at the Edgewater Beach hotel, Chicago, June 8-10, 1950.

(1) About 55% Southern red oak, 25% water oak, and 20% black-jack and other scrub oaks.

(2) About 75% red gum and 25% black and tupelo gums.



The Defibrator produces superior pulp for wallboard, hardboard, insulating board and roofing felt from all kinds of chipped wood or other fibrous ligno-cellulose materials such as bagasse or straw.

The process can be controlled to produce or duplicate any desired degree of freeness or fineness of fibre. Pulp is homogeneous with all fibres intact, but well separated. Yield is high and power costs are low.

AMERICAN DEFIBRATOR, INC. CHRYSLER BUILDING NEW YORK 17, N.Y. *West Coast:* A. H. Lundberg Orpheum Building, Seattle, Wash.

highest quality of product are obtained by keeping such foreign material to a minimum.

2. The disc chipper produces a more uniform chip of higher quality than does the hog-hammermill combination.

Because of these conclusions, a wood preparation system, employing a disc chipper preceded by a barking drum, is being used now at Bogalusa. Nevertheless, as yet, it has not been found feasible to remove more than about 50%-75% of the bark from the oaks and gums.

Pulping—sulphate vs. neutral sulphite—While any of the usual pulping processes can be employed in the production of semichemical pulps, the sulphate semichemical and neutral sulphite semichemical processes are the most common. Both of these methods possess certain advantages; selection of the particular process to be used will depend upon circumstances at the individual mill.

The relative quality of the pulps made by the two processes depends considerably on the species of wood being cooked. Thus, in one experiment the flat crush test obtained with a neutral sulphite semichemical corrugating medium made from black gum was found to be superior to that obtained with a black gum corrugating medium made by the sulphate process. (In each case, about 35% screenings from pine sulphate pulp was added to the furnish because of numerous wet end breaks incurred when only gum pulp was used).

In another much more detailed series of experiments on the semichemical pulping of mixed oaks it was found that a higher quality pulp was obtained by the use of the sulphate process than by the neutral sulphite process.

Since about 7½% pine sulphate pulp was added to each of the various oak furnishes to prevent wet end breaks, while each of the gum furnishes, as already mentioned, contained about 35% pine screenings, the relative value of the oaks and gums should not be inferred from the results of these investigations. As a matter of fact, in actual operations over a considerable length of time, using both mixed gum and mixed oak sulphate semichemical pulps along with pine screenings, it has been found that the oak is only slightly inferior to gum, the respective average flat crush tests on "A" flute board being about 32 and 34.

Degree of cooking—From the standpoint of economy, in cooking semichemical pulp for corrugating board, it is desirable to cook the hardest pulp consistent with high quality and efficient operation in both the paper mill and box factory. Actually, these aims may conflict; the optimum degree of cooking to obtain the best over-all operation may be a compromise solution very difficult to determine. However, this problem has been studied in the case of the oak neutral sulphite semichemical pulps discussed above and also in a series of exeperiments with pine sulphate semichemical pulps.

In both instances, it was found that the hardest pulps, i.e., the oak pulp containing 19.2% lignin and the pine pulp containing 19.4% lignin were not only harder to defiber but also caused more trouble on the paper machine. Also, they did not corrugate as easily. In addition, the quality of the corrugated board from these pulps was apparently a little lower, though the data as to this observation are not conclusive.

On the other hand, the softest pine pulp (12.8% lignin) was too "springy" to run well on the corrugator; while the softest oak pulp (7.7% lignin) tended to crush when the double backer was applied.

In short, the optimum combination for economy, efficient papermachine operation and efficient box factory operation occurred in both cases when the pulps were cooked to a lignin content of about 15%-19%. Harder pulps gave trouble both in the paper mill and box factory; softer pups were not only less economical but also did not run as well on the corrugator.

It is not meant to imply from these results that all species will necessarily give optimum results at this degree of cooking, nor even that these particular species cannot be run satisfactorily at higher or lower degrees of cooking. However, it is believed that the most satisfactory results can be obtained generally within approximately this range.

Liquor recovery—While many semichemical pulp producers do not recover the used cooking liquors, recovery becomes very desirable, when large tonnages are involved—not only because of the economic loss incurred in discarding large quantities of chemical but also because of the resultant stream pollution. Sulphate semichemical cooking liquors, of course, can be recovered by evaporating, burning, and recausticizing. This practice has been followed at Bogalusa since 1941, the semichemical liquor being

mixed with liquor from the chemical pulping prior to evaporation.

The percentage recovery of chemicals has amounted to approximately 45% to 55% when the excess liquor has been blown from globe digesters at the end of the cooking cycle. When the semichemical pulp has been cooked in stationary digesters, blown to diffusers, and the pulp washed (which procedure is now completely replacing the use of the globe digesters at Bogalusa), the chemical recovery has been increased to 80% -90%. Still higher recoveries may be obtained with a more modern system employing a blow tank followed by disc refiners and rotary vacuum washers.

The recovery of the chemicals from waste neutral sulphite liquors in their original form has not yet been accomplished on an economical commercial basis. However, such liquors when evaporated, burned, and causticized in the same manner as sulphate waste liquor yield a liquor of high sulphidity suitable for sulphate pulping. Thus, a combined operation can be carried out in which chemical pulp is prepared by the sulphate process, semichemical pulp by the neutral sulphite process, and the used semichemical cooking liquor utilized as makeup instead of saltcake to replace part of the losses from the sulphate system. This *modus operandi* was followed in the experiments on the neutral sulphite pulping of oak, the entire recovery system having operated normally using the mixed oak neutral sulphite-pine sulphate waste liquors. The percentage recovery of chemicals in these experiments ranged from 77.7% to 93.1%.

Refining—Since semichemical pulps are only softened during cooking, mechanical defibering and refining play a very important part in their production. It is believed that the best type of refining system for producing a corrugating board from semichemical pulp is a two-step system. In the first step, the softened chips should be defibered without excessive cutting; in the second the fibers should be cut, fibrillated, etc., to obtain the desired strength properties in the sheet.

For the defibering stage, disc refiners commonly are used. Such refiners also may be used for the second or refining stage; but other refiners such as jordans are also suitable for this application and commonly are employed for it!

Screens may be used after either stage of refining; they should improve the quality of the sheet as well as the ease of handling on the paper machine. However, they are not absolutely essential. Also, as mentioned previously, the initial defibering may be done prior to washing on rotary vacuum washers. This procedure is advantageous in the refininng as well as in washing because the hot chips, pumped direct to the defibering equipment from the blow tank, are softer and more easily defibered.

In defibering semichemical pulps with disc refiners, actual operating experience at Bogalusa, as well as considerable experimental work, has demonstrated the following facts:

1. It is particularly important to design the feeding system so as to assure a smooth even feed of pulp to the mills.
2. The consistency of the pulp fed to the mills should be fairly high.
3. If operating without screens, as is done at Bogalusa, a hard semichemical pulp should be put through two passes of disc refining before the final treatment in jordans. This practice is advised because if there are any undefibered splinters in the stock going to the jordans, some are likely to get through and cause trouble on the paper machine.

After the initial defibering in disc refiners, the stock should be somewhat similar to raw chemical pulp—its subsequent refining also is similar and needs no comment.

Conclusions—From the preceding operational and experimental data, it is believed that the following conclusions are justified:

1. Satisfactory pulps for corrugating board can be made from a wide variety of wood species, including some hardwoods—such as the oaks, which are not ordinarily considered as suitable for pulping.
2. The most satisfactory method of wood preparation which has been tried is the conventional disc chipper following a barking drum, even though in the case of the hardwoods it has not been found practical to remove all the bark in a barking drum.
3. Insofar as quality of the corrupgating medium is concerned, the sulphate semichemical process is apparently better for some species, such as the oaks; while the neutral sulphite process is better for others, such as the gums.
4. With oak neutral sulphite semichemical pulp or pine sulphate semichemical pulp, the optimum degree of cooking for best over-all performance in the paper mill and box factory is in a range of lignin contents of about 15% to 19%. It also is believed that this same optimum range may be roughly applicable with other species or processes.
5. The used cooking liquors from either process can be recovered, mixed with regular sulphate black liquor, evaporated, and burned without any appreciable difficulties, thereby economizing on chemical as well as reducing stream pollution.
6. In defibering semichemical pulps with disc refiners (which can be done advantageously prior to washing), care should be taken to assure a smooth even feed of high consistency in order to obtain maximum performance.

The Champion machine coating process in the United States and Abroad*

J. R. SIMPSON
The Champion Paper and Fibre Co.

One of the outstanding developments in the paper industry within the past fifteen years has been the successful application of coating materials to the surface of a sheet of paper or board while in the process of manufacture—in other words, machine coating.

Not only has the demand for machine coated grades increased in the United States, the country where it was first introduced, but it also has increased throughout the world. Hardly a paper making country of any consequence is without one or more machine coating installations, either made or pending.

Machine coating and machine coated grades were developed primarily to meet the demand of the printer for a sheet which could outprint the regular supercalendered book grades as were then known to the printing trade.

Pioneering such a development was no easy task. It required the fullest co-operation between the papermaker and paper mill technical staffs to work out the necessary formulas, operational techniques, etc.

After machine coated grades had been developed and put on the market, the printers, ink manufacturers and printing press designers also entered the picture. They helped

*Abridged from a paper presented at the 31st annual convention of The American Pulp and Paper Mill Superintendents Association, Inc., held at the Edgewater Beach hotel, June 8-10, 1950.

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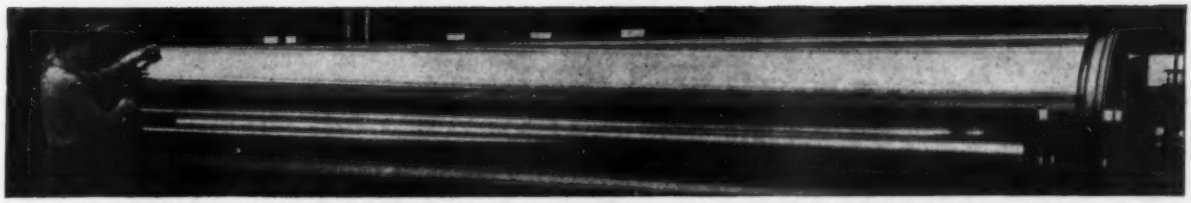

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to develop suitable inks and printing techniques in keeping with this particular type of sheet. Without this help, the whole venture might not have enjoyed the success it has during the past fifteen years.

One of the first entrants to the machine coating field was the Champion Paper and Fibre Co., Hamilton, Ohio, this firm having developed and patented a process by which the sheet was coated directly on the paper machine.

Like with most pieces of equipment, machine coating processes have their various advantages and limitations. It is Champion's opinion that its process is just about the simplest, least expensive, and the easiest to install and operate of any of the processes offered to the paper trade today.

The fundamental technique of the Champion process consists of applying an excess of pigmented coating to the surface of a sheet by means of a roll, revolving in a trough of coating mix, over which the sheet passes and contacts, thereby building into the surface of the sheet a semi-solid filter cake of coating. Following the coating application, the sheet passes over a specially constructed wiping blade or revolving rod, thereby removing the excess coating but leaving the built-in filter cake and a smooth and uniform coating application across the entire width of the sheet.

Following the coating application, the sheet passes over one or two bare dryers with the coated surface away from the dryer surface or surfaces. This practice permits the coating to dry sufficiently to prevent it from sticking to the surfaces of the succeeding dryers or their dryer felts.

During a break or the slackening of the web over the wiping blade for one reason or another, it is conceivable that an excess coating would be permitted to pass on to the dryers. Such an excess would cause them to smear. To prevent an occurrence of this kind, an automatic electric break detector is placed on the sheet ahead of the coater.

When the sheet slackens sufficiently, this detector automatically stops the coater roll. While the coater roll is stopped and no coating is being applied to the sheet, the dryers obviously will remain clean. Incidentally, the drive motor on the coater roll is now equipped with an automatic brake, insuring an almost immediate stoppage of the roll itself.

Several methods of bypassing the coaters have been developed. These methods depend on the types and weights of paper or board being manufactured. Movement of the coater is accomplished by means of a motor, cross-shaft, screws and reduction gears and with the raising and lowering speeds regulated to prevent breaking down the sheet during this operation.

The location of the coaters within a dryer section is usually determined after a study has been made of the machine to bear the installation and the grades which it is to coat.

It is quite desirable to locate the coaters between dryer sections whenever possible, thus providing a control of tension of the sheet over the individual coater.

The moisture content of the sheet at the coater stations will vary somewhat. The amount of variation depends on the grades, furnishes, speeds, number of dryers available, breaks in the dryer sections, etc. Generally speaking, the coaters are located as follows: first coater, where the sheet is approximately 50 to 55 per cent dry; second coater, where the sheet is 60 to 65 per cent dry.

On book grades, where both sides have to be coated, the wire side of the sheet is coated first; then, after passing over six or eight dryers, the sheet is reversed and the top or felt side is coated. Following the felt side application, the sheet passes over sufficient dryers to complete the drying operation before passing to the machine calenders.

Most machine coated book grades are finished on super-calenders; while boxboard and similar grades are finished on machine calenders only, using the regular water box method of finishing.

In the coating of boxboard, two applications to the lined side are recommended. In the majority of cases, these applications are made to the top side of the sheet. The second application, because of the rougher surface on boxboard, greatly enhances the appearance of the board, and improves the printability of this particular type of sheet.

On the other hand, most boxboard mills using the Champion process have established separate grades. These mills use either one or two coaters, depending on customers' specifications. Many thousands of tons of single coated boxboard have been made and sold during the past ten years.

A distinct improvement has been made on the most recent boxboard installations. This improvement has come about as a result of research for better printing surfaces.

Reference is made particularly to those installations where water-cooled, chilled-iron smoothing rolls have been placed directly ahead of one or more of the coaters. The results have been most satisfactory, not only in connection with the coated grades but with the uncoated products as well.

When a single coated application is scheduled on a machine, the mill usually takes advantage of the smoothing rolls prior to applying coating in order to produce the best sheet possible.

Incidentally, the Champion process has been applied successfully to machines having double, triple and stack type dryers.

The coating preparation equipment employed in connection with the Champion process can be of almost any standard make. However, specially designed mixers, cookers, pumps, screens, etc., have been developed. These items have proven very satisfactory and quite suitable to the type of mixing, solids, viscosity, etc., necessary to the Champion process.

The cooker can be either the indirect or direct steam type. Also, it can be equipped with either slow speed paddles (30 rpm) or with the higher speed whizzer disc type of agitator (900 rpm).

The clay mixer is designed for high speed agitation (1800 rpm). It uses the whizzer type disc agitator and is capable of thoroughly mixing dispersed or pre-dispersed low viscosity clays or pigments at solids up to 70%.

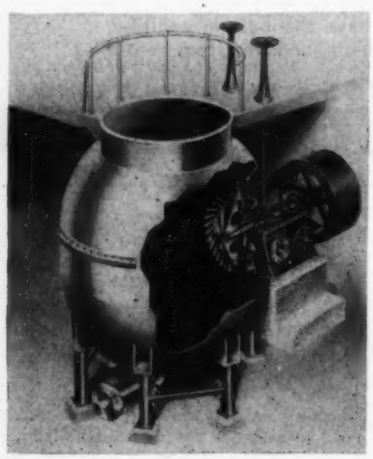
This clay mixer is not suitable for the high viscosity clay mixtures used on some other types of machine coating processes.

With a view to cleanliness, most installations have been made of stainless steel equipment whenever possible.

In presenting this description of the Champion process, attempt has been made to emphasize the importance of better surfaces on which to apply coating. This factor is quite important, regardless of the process, as the quality of the finished product, in any event, is affected by the condition of the surface and the type of base stock used.

While our immediate interest is centered chiefly on machine coated grades, and better surfaces on which to coat are being advocated, the fact remains that any development made to improve the surface of the coated sheet usually reflects itself in the uncoated product as well, and no such development should be overlooked.

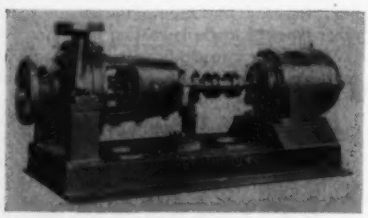
The Paper Industry New Products



Pulper

Due to a handwheel controlled setting of bars, the "Slush-Maker" pulper can assure complete defibering of high wet strength papers without damaging the fibers, even in the most difficult cases. The manufacturer has shown how setting the bars of the disintegrating rotor at various clearances from the bars on the attritioning ring has a decided effect on the efficiency of disintegrating and defibering. The "Slush-Maker" gives an initial disintegration that clears the stock of all except a few pinhead size specks, which will easily disappear in subsequent beating or refining.

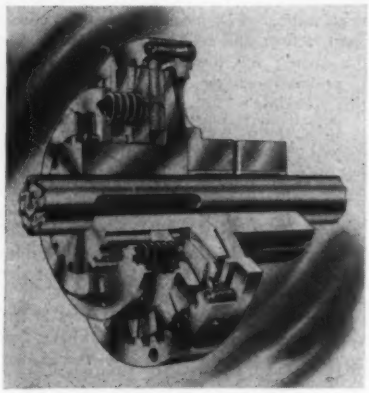
In addition, the "Slush-Maker" brushes flakes and bundles out of the stock, mixes color and other additives in, blends furnishes and gives a preliminary beating treatment. Its unique construction is shown in the cutaway view. The tank can be made of steel, tile or other materials. Morden Machines Co., Pacific Bldg., Portland 4, Ore.



Process Pumps

An improved line of pumps known as "Type Q" is especially designed for use with "Dowtherm" hot oil, condensate, propane, butane, gasoline, chemical and process liquors at temperatures up to 800 F. Several features contribute to trouble-free operation of the pumps: vertically split casing with centerline support to maintain alignment at all tempertures; an extra deep, water jacketed stuffing box; a special sleeve construction which prevents leakage; and water-jacketed bearing housings.

Twelve sizes are included in the new line, with capacities ranging from 10 to 1000 gpm at heads up to 325 ft. Standard models include bronze fitted, all iron, all bronze, steel and stainless steel. Economy Pumps, Inc., Hamilton-Thomas Corp., Hamilton, O.



Slip Clutch

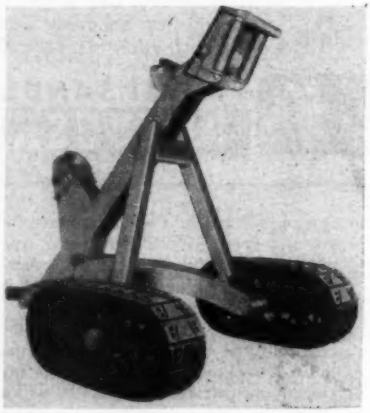
This new slip clutch has been designed to help solve the problem of maintaining constant tension or constant torque on winding operations. It is also a safety device for overload protection or to maintain constant torque regardless of driving speed.

Special features include ventilated plates, cooling fins and pressure springs with long deflection range for accurate adjustment. Single, double and triple plate construction is available. Some models are constructed with a disc spring and metallic friction plates in a compact design to fit small spaces. In sizes from 2⅜ in. diam. to 27 in. diam., with torque range up to 10,000 ft. pounds and heat capacity up to 8½ hp. Hilliard Corp., Elmira, N.Y.

Fork Trucks

Easy operation and easy maintenance have been kept in mind in the new Baker line of Type FC Center-control fork trucks. Operation is simplified by one pedal which controls power and braking, and by clearly labeled levers for controlling operations. Maintenance is made easy by accessibility of all parts. Average time for removing power axle is said to be 60 minutes; for removing trailing axle, 20 minutes; for relining brakes, 30 minutes.

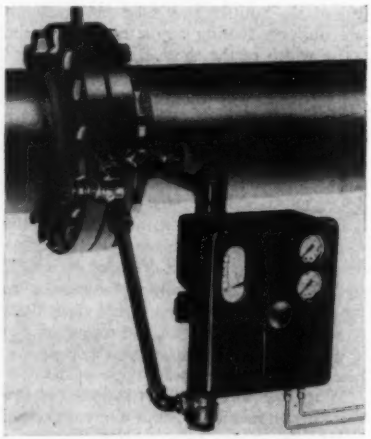
The more functional design of the new line also makes for lower initial cost and upkeep. Baker Industrial Truck Div., Baker-Raulang Co., 1250 W. 80th St., Cleveland 2, O.



Logging Arch

The newest Hyster logging arch, the Model "80," offers reduced weight and greater maneuverability and speed for heavy-duty use on such woods as redwood, heavy pine and fir. This model has a basic A-frame design and box-type structural members, and in addition has an increase of approximately one foot in roll height at the top of the main roll. Bigger payloads and increased speed and production are the result of these features.

Boom tip fairlead rolls and lower guide sheave are made of manganese steel to give extreme abrasion resistance and long life. Specification sheet available. Hyster Co., Portland 8, Ore.



Differential Flow Transmitter

Differential pressure is measured by the V/A Cell, a simplified precision flow transmitter. Using a basic variable-area type design, it measures a by-passed portion of the main-line flow, and provides continuous self-purging. It is mercuryless but does not

Accurate Consistency Regulation which can be CHANGED by just a turn of a knob

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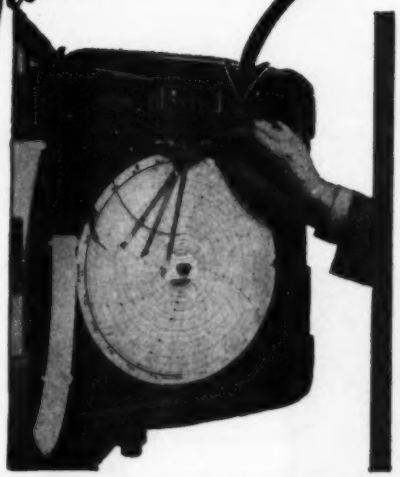

Maintains accurate, 24-hour chart of stock consistencies . . . recording regulated consistency and indicating consistency of unregulated stock entering flow box.

The constant recording on chart permits operating personnel to see and know that accurate, uniform consistency is maintained, and that the incoming stock is always above the desired consistency thereby permitting constant stock control.

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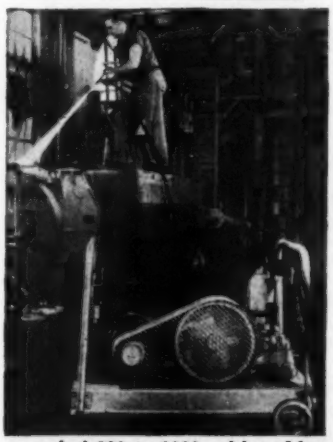

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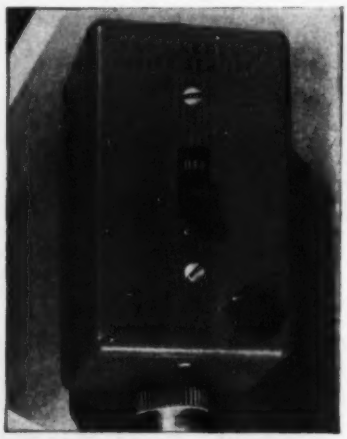
utilize a diaphragm of any kind. Manifold systems, bellows, seals, exterior purges and condensate chambers are also eliminated.

The V/A Cell can be used on liquids, gas and vapor streams, including steam. All wetted parts are of 316 stainless steel. Fischer & Porter Co., 42 County Line Rd., Hatboro, Pa.

Control System

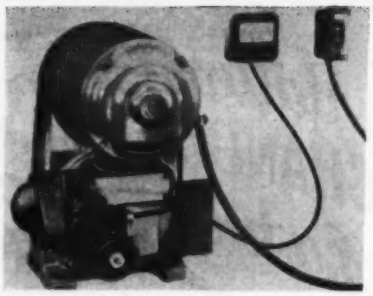
The Series P.A.T. '50 control system is applicable to the regulation of temperature, *p*H, chemical concentration and gas analysis. It introduces rate action, so that the faster the change in the controlled variable, the wider the valve is opened, thus reducing the length of time that a change can force the controlled process off its set point.

Offering even greater sensitivity than its predecessor, the new P.A.T. '50 has no moving parts; control action is accomplished by electronic circuits. Major electronic components are plug-in types, easily replaced. Valve position can be measured remotely at the control panel. Existing P.A.T. installations can be converted to the '50 by replacing the Control Unit. Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa.



Motor Starter

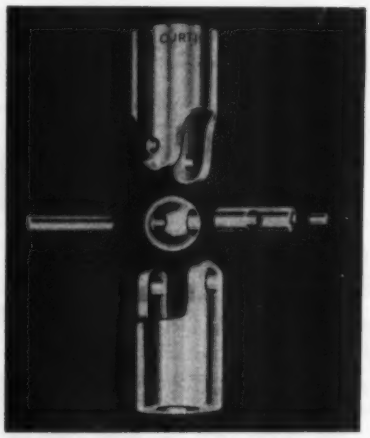
The Motor Sentinel Class 10-023 is a manual starter equipped with an indicating light to show when the motor is running. It is especially useful for fans, pumps, compressors and other small motor equipment. Quick-make quick-break action is provided; proper selection of the replaceable heater allows sufficient time delay for small motor starting. Safe-capacity overloads are provided for in the positive bimetallic overload protection, but the motor is automatically disconnected on any sustained or damaging overload. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.



Power Drive Remote Control

A new package remote control unit is available for Sterling Speed-Trol electric power drives. It may be mounted on any size Speed-Trol in current use, or may be ordered with new equipment.

The unit includes a mounting bracket, reversing motor, chain and sprockets, friction clutch, chain guard, and remote fast-slow station. Remote speed indicator is optional. For use where a remote or automatic control of a variable speed motor is necessary. Sterling Electric Motors, Inc., Los Angeles 22, Calif.



Universal Joint

The new "Lo Friction" is a universal joint which has been developed primarily for industrial applications where the joint friction heat or kinetic energy must be dissipated rapidly. By reducing bearing surfaces in the friction block and by providing for constant lubrication through the use of a patented oiler, this joint is remarkably heat resistant. The photograph shows the "Lo Friction" joint at the top (driving end) and the standard joint at the bottom (driven end).

The joint is available in single or double joint form, and in 1¼ in. o. d. or larger. Curtis Universal Joint Co., Inc., Springfield, Mass.

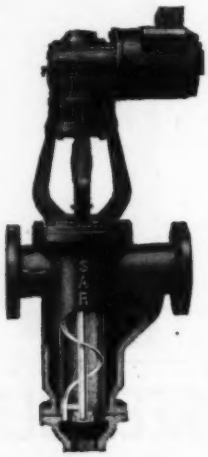
Re-Wind Unit

The Sperry Re-Wind, for use with various types of web processing equipment, incorporates variable speed hydraulic drive with dancer control to eliminate oscillation. Finished rolls of diameters to 44 in. are center-wound at high speed with constant deceleration. The dancer acts to maintain web tension. Any tendency toward variation in tension is reflected by movement of the dancer in an amount just sufficient to regulate the output of the servo mechanism, which in turn controls the rate of deceleration of the roll. This system of uniform tension produces rolls that are uniform in density and free of telescoping. Ford Instrument Co., Graphic Arts Div., 31-10 Thomson Ave., Long Island City 1, N.Y.

High-Pressure Gasket

The new Style CGI gasket for jointed connections is a compression gauge type with both an inside and outside ring. The inside steel ring practically fills the flange recess so that no turbulence is set up; flow is increased through the joint.

The CGI is made for practically all standard A.S.A. and A.P.I. fittings as well as special designs. Pressure range is 150 to 2500 lb. Flexitallic Gasket Co., 8th and Bailey Sts., Camden 2, N.J.



Pipe Scraper Strainer

A patented device, not marketed by any other company, is the built-in scraper blade of this pipe line Scraper Strainer. The strainer screen is cleaned without interrupting the flow of the fluid; maintenance work of removing and cleaning the screens is thus eliminated.

The scraper blade rotates continuously inside the cylindrical screen (see cut), operating like a worm gear. Solid particles and scum are scraped off as quickly as they are trapped. Foreign matter cannot be forced through the screen by back pressure in the strainer. A cleaner screen and more efficient operation are thus assured. Motor-driven or hand operated models available. Sarco Co., Inc., Empire State Bldg., New York 1, N.Y.

Storage System

Warehousing of any item which can be handled by a fork lift truck is made completely mechanical by the new Stak-Rak Selective Storage System. In addition to eliminating all warehouse labor except one push-button operator, the system utilizes cubic space efficiently by use of an overhead fork lift arrangement.

It consists of rack-columns in rows with aisles just wide enough to admit a fork-lift truck which is suspended from a trolley on an overhead crane bridge. A single operator can control the truck to place or remove any

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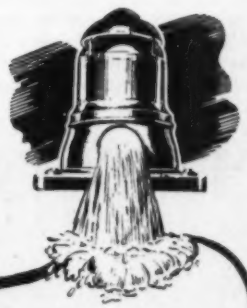

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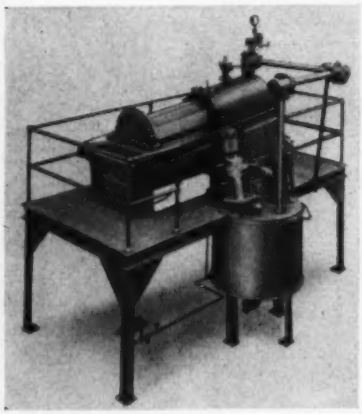
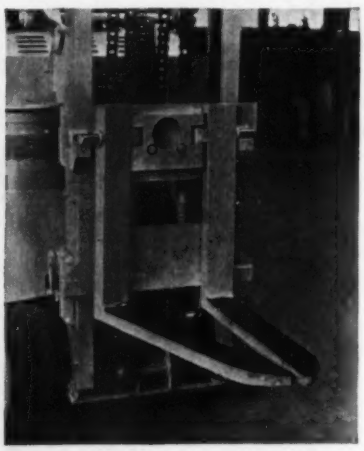
item from its place on the rack in any aisle. Aisle requirements for loads up to 2000 lb. are the dimension of the unit to be handled plus 8 in. clearance. This is said to be one-half the space required for ordinary fork trucks. Engineering and design facilities are supplied by the manufacturer. Chicago Tramrail Corp., 4000 W. Washington Blvd., Chicago 24, Ill.



Kelly Sulphur Filters

A line of jacketed pressure filters has been designed especially for clarifying molten sulphur, and offers the same advantages for this purpose as the standard Kelly Pressure Filter. A new improvement is a simplified internal manifold type leaf outlet with single external connection. Units are jacketed to maintain the proper constant temperature of the sulphur charge during filtration.

Five sizes comprise the line, of which four are available in "packaged" units, with the filter assembled with all auxiliaries and accessories. Oliver United Filters, Inc., New York, Chicago and Oakland.



Pivoted Fork Tines

With these newly designed pivoted forks for power lift trucks, it is not necessary for the truck and pallet to be in alignment before lifting or depositing a load. The truck may approach and handle a load at an angle of as much as 45 degrees from parallel, depending on length of tines and width of pallet.

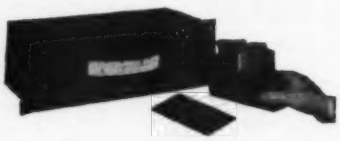
Each tine is adapted to swing inward from normal straight forward position. Both may come together, in the form of a V, or one may remain in normal position while the other is moved over far enough for the outer end to touch it. Movement of loads in congested areas is thus facilitated.

The unit is furnished as an integral part of some models of fork trucks, or may be supplied as an attachment for standard models. Elwell-Parker Electric Co., Cleveland, O.

Regulator

The microsyn, consisting of a moving element in a four-pole field, is manufactured with such precision that it can provide regulation in infinitesimal steps, making it a far more versatile and accurate instrument than the conventional step regulator. It can (1) produce a voltage proportional to turning a rotor over a range of plus or minus 10 degrees, with a sensitivity of 20 seconds, (b) produce a torque that is linear with the square of a signal current, and (c) act as an elastic restraint generator, producing a torque proportional to the product of the square of a current and the angular displacement.

The specially processed Hipernik of which the microsyn is made gives it its accurate and consistent characteristics. Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa.



Pyrometer Controls and Indicators

Pyrometer equipment, including indicators, controllers and protectors for furnaces, ovens and kilns, is now available in a variety of flush- or surface-mounted models. An indicator shows any change in temperature equal to 1/10 of 1 per cent of full scale. Immediate control action follows. The Type HP-3 controller, illustrated, provides On-Off action of the final control element by either a relay, a mercury switch, or a contactor through which electric power is supplied to the furnace or oven.

In addition, a pyrometer protector may be used, usually in conjunction with and to protect against the possible failure of a precision controller. General Electric Co., Schenectady 5, N.Y.

New Product Briefs . . .

▶ LIFE-LINESTARTER — A combined motor starter and disconnect features a safety handle and simple see-saw action to insure positive opening. Designed for across-the-line starting of squirrel cage induction motors, or as primary switch for wound rotor motors. Capacities from ¼ to 100 hp. Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.

▶ HEATING UNIT—Portable heat sources for applications requiring from 100,000 to 1,000,000 Btu's are supplied by these Thermobloc models. They have shown greater efficiency than conventional equipment such as salamanders, and are completely portable and self-contained. Prat-Daniel Corp., Thermobloc Div., East Port Chester, Conn.

▶ SNOW PLOW—This attachment for snow removal can be used with Clark fork-lift trucks and is easily attachable without tools. It rides below the forks of the truck, and pushing force is exerted at the lowest point and in a normal level plane. Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.

▶ STRAIN RECORDER—This new strip-chart recorder, known as the Baldwin-Sanborn, reproduces both static and high-speed SR-4 strain gauge measurements. It is a direct-writing, inkless, vacuum-tube voltmeter with great ruggedness and simplicity of operation. Baldwin Locomotive Works, Philadelphia 42, Pa.

▶ REMOTE CONTROL—A new mechanical remote control for Sterling Speed-Trol (variable speed) electric power drives is available for new equipment or for adapting any Speed-Trol now in use. Designed so that the operator will always have the handwheel control accessible, it is made in a variety of types. Sterling Electric Motors, Inc., Los Angeles 22, Calif.

▶ PALLET TRUCK—The Model "W" electric pallet truck will handle loads of up to two tons with rapid raising, smooth hydraulic lift, and great maneuverability. New circuits and design features have been planned to give long periods of operation. Towmotor Corp., Cleveland 10, O.

▶ TURBINE-GENERATORS—A new line, the WA-Series steam turbine-generators, incorporate maximum economy for units from 250 to 150,000 kw. Governor and regulating characteristics provide for paralleling with existing units and tie-lines. Simple three-bearing unit construction. Allis-Chalmers Mfg. Co., 991 S. 70th St., Milwaukee, Wis.

▶ DRUM CLAMP — This forked clamp is equipped with removable rubber-faced grab plates for picking up individual cylindrical drums or barrels. Without the plates, the clamp handles the complete pallet load. The forks are adjustable from 19 in. inside spacing to 32 in. Baker Industrial Truck Div., Baker Raulang Co., 1250 W. 80th St., Cleveland 2, O.

▶ WATER HEATER—The Swartwout Junior feed water heater utilizes exhaust steam to heat water before it is delivered to the boiler. It is designed especially for small plants with boiler capacities of 300 hp. or less. The saving in fuel by the use of exhaust steam is said to be 1 per cent for each 11 degree increase in feed water temperature. Swartwout Co., 18511 Euclid Ave., Cleveland 12, O.

▶ MOTOR STARTER—The Motor Watchman, Class 10-100-S1, starts, stops, and provides overload protection for single phase, polyphase and D-C motors. Protection of operating personnel and positive motor-protection are assured. Westinghouse Electric Corp., P.O. Box 2099, Pittsburgh 30, Pa.

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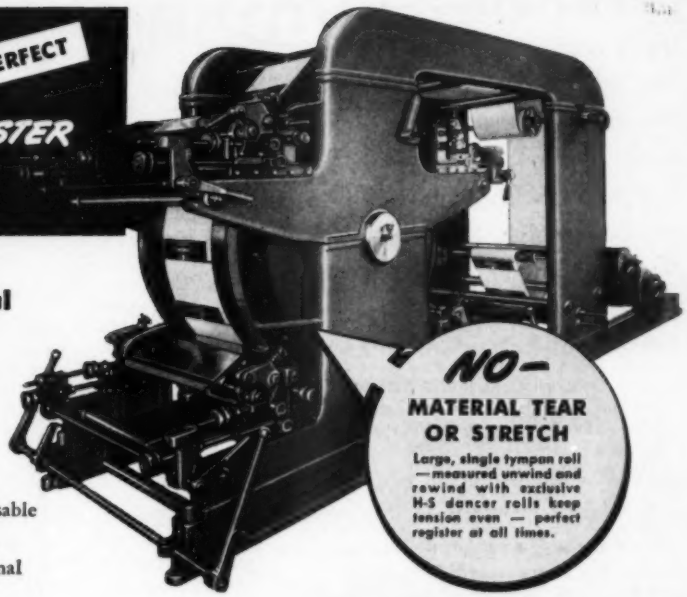

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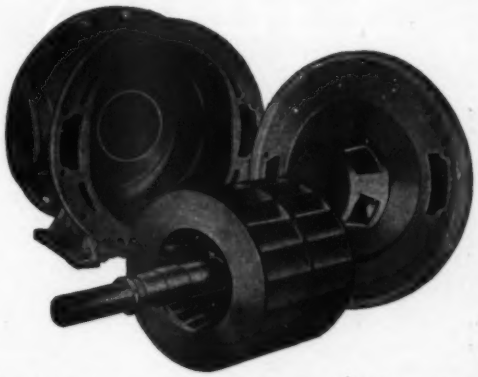

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The Paper Industry New Literature

Books

PREPARATION AND TREATMENT OF WOOD PULP. Vol. I of "Pulp and Paper Manufacture." Prepared by the Joint Textbook Committee of the Paper Industry of the U.S. and Canada. J. Newell Stephenson, Editor-in-Chief. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N.Y.

Pulp and Paper Manufacture is the title of a projected series of four books which will replace Volumes III-V of the old series entitled *The Manufacture of Pulp and Paper*. Volumes I and II of the original series, on the mathematics, physics and chemistry of the paper industry, will not be revised, but will be kept in print as long as the demand warrants. "Preparation and Treatment of Wood Pulp" is Volume I of the new series, and replaces Volume III of the old.

Each of the eight sections of the old text has been thoroughly revised, with information on the manufacture of wood pulp brought up-to-date. The section on alkaline process pulps, for example, has been completely rewritten and greatly expanded. Technology and operating problems are stressed throughout, and review questions are given at the end of each chapter.

For study in the classroom or in the field, the processes have been carefully organized and clearly labelled and numbered, making reference quick and easy. Illustrations are confined to line diagrams and charts.

The remaining three volumes of the new series, still in preparation, will be: "Preparation of Stock for Paper Making," "Manufacture and Testing of Paper and Board," and "Auxiliary Paper Mill Equipment."

HANDBOOK OF CHEMISTRY AND PHYSICS, 32nd edition. Edited by Charles D. Hodgman. Published by Chemical Rubber Publishing Co., 2310 Superior Ave., N.E., Cleveland, Ohio. 2879 pages. 7½ x 5. $7.50.

This, the latest edition of the Handbook, has been revised and brought up to date. About 335 pages of the volume have been completely revised in accordance with new developments; the table of isotopes has been enlarged and rewritten, and the bibliography to literature has been extended to 92 pages.

The final report of the Committee on Letter Symbols and Abbreviations has permitted the inclusion of a completely revised section on this subject. Other sections, including Description of the Elements, Periodic Table of the Elements, Properties of Commercial Plastics, Organic Analytical Reagents, Potentials of Electrochemical Reactions, Properties of the Amino Acids, Surface Tension, Vapor Pressure, Dielectric Constants, and Plate and Film Speeds have been entirely redone.

The old tables found necessary in previous issues have been augmented in this volume with the inclusion of tables on Steroid Hormones, Electron Work Functions of the Elements, Centrigrade-Kelvin Conversion Table, and Scientific and Engineering Abbreviations and Symbols.

LABOR RELATIONS WORK KIT. Edited by Lawrence Stessin and staff of Employee Relations Bulletin. Published by National Foremen's Institute, Inc., New London, Conn. 200 pages. $7.50.

This manual is designed to inform labor relations and personnel men of some of the more successful techniques worked out by other companies as solutions to particular problems.

The manual is written not from a theoretical viewpoint, but rather from a factual one. Names of companies which have worked out specific problems are given, together with how the particular problem was solved. Step-by-step histories of troublesome situations are given, with their solutions. Illustrations accompany many of the cases cited.

Successful experiments of others detailed in this book should assist any management in improving labor relations or personnel practice programs.

PERSONNEL PROBLEMS UNDER MOBILIZATION and WAGE POLICY AND PROBLEMS IN A PREPAREDNESS ECONOMY, Personnel Series 135 and 136. Published by American Management Association, 330 West 42nd St., New York 18, N.Y. 9 x 6. No. 135, 62 pages; No. 136, 35 pages. Paperbound. Both $1.00 to Association members, $1.25 to non-members.

Both books are collections of papers on personnel management which were read at the Fall Personnel Conference of the AMA held in New York last fall. The first book analyzes management's personnel and economic problems in the mobilization period ahead. Papers included are: Security and Loyalty Considerations in Personnel Administration, Personnel Problems Under Mobilization (a panel consisting of three papers and a discussion), Economic Policy Faces the Future, Maangement's Challenge in the Coming Decade, and Approaches to Economic Education.

The second book, which includes papers titled Thinking Behind the 1950 General Motors Agreement, Impact of Mobilization on Company Wage and Salary Structures, Collective Bargaining in a Transition Economy—a Trade Unionist's View, Economic Issues in Labor-Management Relations, and Trends in the Wage and Salary Picture, is concerned with the impact of the mobilization program upon wages, salaries, and various aspects of collective bargaining.

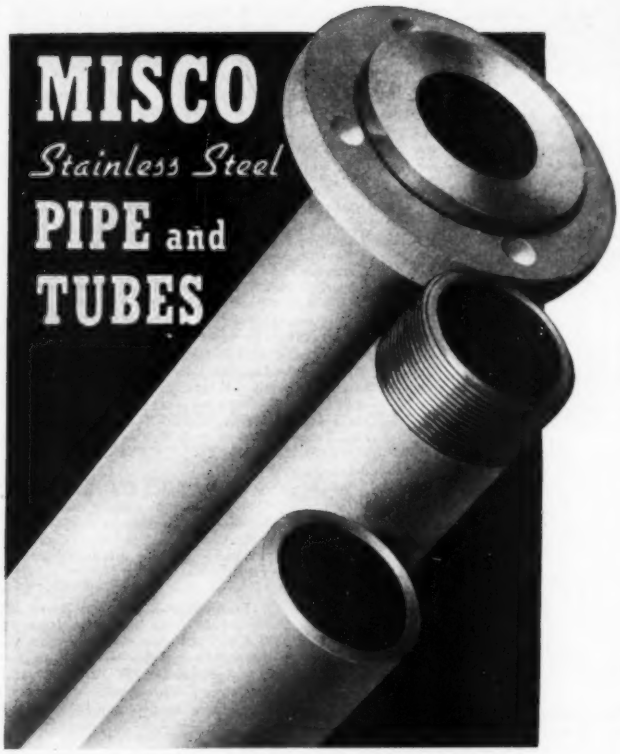
Booklets and Pamphlets

TALCS. Published by Whittaker, Clark & Daniels, Inc., 260 West Broadway, New York 13, N.Y. Free. This manufacturer offers a paperbound booklet filled with valuable information about talc, its uses, properties, and variations. Divided into three sections, the chapter entitled "Uses" lists several hundred uses of talc in such as pulp, paper, ceramics; the following chapter, "Data," describes in detail the specific talcs which are suggested for various industries in "Uses." A final section, "Specialties," suggests unusual ways talc may be utilized.

A NEW ERA OF FOREST MANAGEMENT, by Vernon E. Johnson. Published by Canadian International Paper Co., Montreal, P.Q., Canada. 23 pages. This well-illustrated booklet is a reprint of an address given by Mr. Johnson, vice president and general manager of Canadian International, before the International Circulation Managers' Association, held at Murray Bay, Quebec, June 13, 1950. Excellent background material on the harvesting of tree crops is presented here, as well as ideas of the future of the tree crops.

YOUR SOCIAL SECURITY BENEFITS. Published by Commodity Research Bureau, Inc., 82 Beaver Street, New York 5. 32 pages. Sample copies sent free to interested company officials or executives; detailed quantity price schedule submitted upon request. This booklet competently and clearly explains the new Social Security laws, outlining what benefits workers and their families may claim under various circumstances. A comprehensive section deals with benefits payable to wives, widows, or working women; other sections concern the self-employed worker, how benefits can be secured, and public assistance to the needy.

PREFERRED IRON CORE DIMENSIONAL SPECIFICATIONS. Published by Metal Powder Association, 420 Lexington Ave., New York. 25c per copy. This new booklet, known as M.P.A. Standard 11-50T, defines terms commonly associated with electronic cores made from iron powder and specifies preferred dimensions of standard insert iron cores and threaded iron cores. Developed after investigations were made by members of the Electronic Core Subcommittee of the Metal Powder Association Standards Committee, the specifica-



CENTRIFUGALLY CAST STAINLESS STEEL PIPE AND TUBES
LARGE AND MEDIUM WEIGHT STAINLESS STEEL
CASTINGS—CENTRIFUGAL CASTINGS

MISCO Stainless Steel Pipe and Tubes are centrifugally cast from induction melted metal. Available in any commercial stainless steel analysis to suit requirements, they are produced in a wide range of sizes with wall thicknesses of ¼" and up. We are pleased to recommend the preferred analysis to meet your needs. All Misco Stainless Steel Pipe is pressure tested and offers dependable protection against most corrosive conditions.

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Write now for your copy of this 12-page bulletin. Contains information of particular interest to pulp and paper manufacturers requiring stainless steel pipe and tubular shapes.

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Carrier Rope
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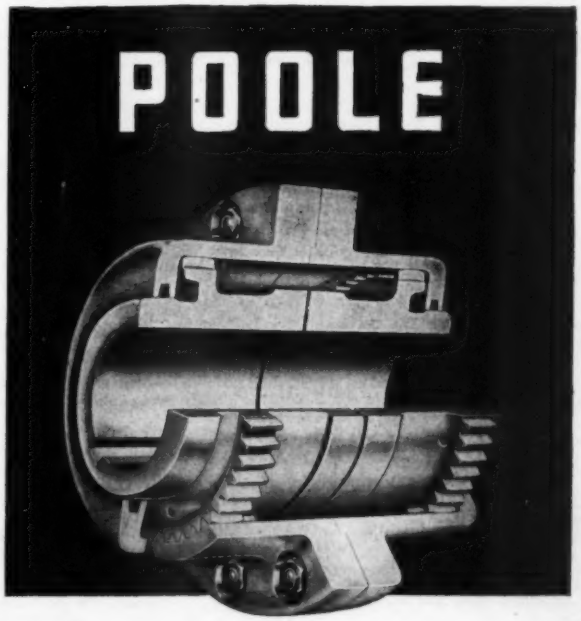
POOLE



A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

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WOODBERRY, BALTIMORE, MD.

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In A Hurry?
This section offers a quick and direct method of contacting professional and business service consultants.

tions include those for core diameters, lengths, screw inserts, insert size of tuning and insert cores, screw driver slots for inserts, spaded inserts, as well as many others.

THE NATION'S WOOD SUPPLY. Published by American Forest Products Industries, Inc., 1319 Eighteenth St., N.W., Washington 6, D.C. 23 pages. This booklet explains what has been and is being done to insure an adequate wood supply for America today and tomorrow. The booklet is a concise pictorial presentation of statistics concerning wood supply. Charts and diagrams are adequately explained.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY *lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.*

Sizing. Monsanto, Everett Station, Boston 49, Mass.—"Mersize CD-2," 12 pages, describes techniques and savings in hard sizing with a mixture of rosin and Mersize. Actual cases are cited, and trial mill runs are offered.

Bleaching Method. Buffalo Electro-Chemical Co., Inc., Buffalo 7, N.Y.—Cold steep bleaching of wood pulp is described in a new, untitled of the equipment, chemicals and methods used for treatment of groundwoods, unbleached bulletin of this company. Full details are given sulphites, neutral sulphites, semi-chemicals and krafts.

Pump Catalogue. Allis-Chalmers Mfg. Co., 991 S. 70th St., Milwaukee, Wis.—Bulletin 52B6059G is a 16-page "Handy Guide to Selection of Centrifugal Pumps." Pumping units for every industry are catalogued, and head capacity charts and tables are given along with data on sizes, capacities and construction features.

Pipe Line Scraper Strainer. Sarco Co., Inc., Empire State Bldg., New York 1, N.Y.—The patented scraper strainer, which is self-cleaning, is described in Bulletin No. 1125-A, 2 pages. Applications are shown in pictures, and a list of all models is given, with prices.

Heat Processing Instruments. General Electric, Apparatus Dept., Schenectady, N.Y.—"Pyrometer Equipment," 8 pages, offers rugged precision instruments for indication of temperature, control of temperature, and protection of heat process equipment. Four models are covered.

Sulphur Filter. Oliver United Filters, Inc., 33 W. 42nd St., New York, N.Y.—Bulletin No. 113-P, 2 pages, pictures and describes several models of the Kelly Sulphur Filter, and suggests uses for this molten sulphur clarifier.

Water Heater. Swartwout Co., 18511 Euclid Ave., Cleveland 12, O.—A 2-page bulletin describes the Swartwout Junior feed water heater, for preheating feed water supply in small power plants of 300 hp. or less. All specifications are given, including shipping weights.

Grabs. Mansaver Industries, Inc., 3105 East St., New Haven 3, Conn.—Bulletin G-2, 8 pages, covers the types of grabs available for hoisting in many industries. Two pages are devoted to paper mill models, with photographs of each piece of equipment, and a brief description of features.

Roll Changer. Dilts Machine Works, Div. of Black-Clawson Co., Fulton, N.Y.—4-page bulletin titled "The Kohler System" gives general information about Kohler unwind and winding equipment, the Flying Paster and the Flying Starter. This bulletin directs attention to detailed specifications of each machine, also available.

Pneumatic Pumps. Blackburn-Smith Mfg. Co., Inc., Div. of Condenser Service and Engineering Co., Inc., Hoboken, N.J.—In 12 pages, "The Blackburn-Smith Pneumatic Sewage Ejector System" presents advantages of these pumps over centrifugal sewage pumps, and describes their operation with diagrams. A specification form is given, and features of single and duplex type pumps are listed.

Pallet Systems. Barrett-Cravens Co., 4609 S. Western Blvd., Chicago 9, Ill.—Bulletin P-476, 16 pages, entitled "Designed for Pallets," contains data on pallet design and palletized carloading with hand and electrically operated lift trucks. Barrett lift trucks are illustrated and described.

Hydraulic Drives. Twin Disc Clutch Co., Racine, Wis.—"Production Road," a 16-page magazine presentation of the history of hydraulic power transmission, introduces in feature-story fashion some of the hydraulic drive products of this company. Applications for the equipment are suggested.

Dryers. Downingtown Mfg. Co., Downingtown, Pa.—A new catalogue, Bulletin No. 1150, describes dryers, frames and rope carriers for the paper industry. 8 pages, profusely illustrated.

Lithograph Equipment. Rutherford Machinery Co., Dept. MA4, Div. of Sun Chemical Corp., Long Island City 1, N.Y.—A 16-page catalogue, well illustrated and uniquely arranged, shows Rutherford machinery of all kinds for lithography. Included are process cameras, embossing machines, coating machines, container printers, and other special machinery.

Miniature Pump. Milton Roy Co., 1300 E. Mermaid Lane, Philadelphia 18, Pa.—Bulletin MP-50 shows the "miniPump," a new controlled volume pump that will handle liquids in the cc per hr. range with metered accuracy. Construction of simplex, duplex and multiplex models is explained in detail. For use in laboratories, pilot plants, and production work.

Non-Ventilated Motors. Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.—Bulletin 1215, 4 pages, covers two new totally enclosed, non-ventilated, squirrel cage, induction motors with continuous duty ratings built in NEMA standard frame 284. All important design features are illustrated.

Scoop Truck Accessory. Towmotor Corp., Cleveland, O.—A 2-page data sheet gives pictures and information on the Hydraulic Scoop Accessory, for picking up bulk materials with the Towmotor lift truck. Operation, including lifting and dumping, is clearly shown.

Kinetic Flow Meter. Fischer & Porter Co., Hatboro, Pa.—Catalogue Section 42, 12 pages, presents the V/A (Variable Area Metering) Cell, a kinetic manometer. Advantages of its simplified, mercuryless design are pointed out, and operation is described in detail.

Universal Joints. Curtis Universal Joint Co., Inc., Springfield 7, Mass.—4-page catalogue suggests types of universal joints for various applications. The new "Lo-Friction" joint for offset drives is featured. Tables of dimensions and prices are given.

Spray Valve. Farval Corp., 3251 E. 80th St., Cleveland 4, O.—Bulletin No. 60, 4 pages, describes lubrication of open bearing surfaces by the Farval spray valve. A detailed diagram shows its operation, and its advantages are explained.

Worm Gear Equipment. Cleveland Worm & Gear Co., 3249-59 E. 80th St., Cleveland 4, Ohio.—Bulletin No. 130 describes a line of worm gear speed reducers similar to those described in the older Bulletin No. 200, but with several engineering improvements. Horsepower rating tables are revised and redesigned. 36 pages.

Chemical Feeders. Omega Machine Co., Providence 1, R.I.—Bulletin No. 20-G14 is devoted to three sizes of "Universal Feeders" to handle dry chemicals in process industries and the treatment of water. 12 pages, with diagrams, specifications, and photographs of operations. Quotation request sheet included.

Regulators. Spence Engineering Co., Inc., Walden, N.Y.—A 32-page booklet on pilot-operated pressure and temperature regulators covers in detail such items as main valves, controls, strainers, thermostats, and desuperheaters. Specifications and case problems are given.

Tubing Terms. Babcock & Wilcox Co., Beaver Falls, Pa.—A 20-page, pocket size booklet, No. TB-335, gives a glossary of terms used in the manufacture and application of steel tubing. Many meanings not generally known are brought out.

Welding. Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N.Y.—"Manual of Welding Engineering and Design," 44 pages, is the first in a series of technical manuals on latest developments in welding materials and techniques. It covers Eutectic low temperature welding alloys and fluxes, with handy information on all phases of welding.

Cranes. Thew Shovel Co., Lorain, O.—A 20-page bulletin covers applications of Lorain cranes to industrial material handling. No product description; only suggested uses in various industries. A second bulletin, 12 pages, titled "Lorains on Pipeline Construction," tells how Lorain power shovels and cranes are used for long distance pipelining.

Soot Blowers. Vulcan Soot Blower Div., Continental Foundry & Machine Co., Dubois, Pa.—Bulletin 484, 20 pages, describes a number of installations of Vulcan automatic sequential soot blowers in large central power stations.

Research Consultants. Foster D. Snell, Inc., 29 W. 15th St., New York 11, N.Y.—Chemical research and engineering by a consultant laboratory is described in this brochure, entitled "Research Facilities Without Capital Investment." Snell facilities are outlined, and questions and answers on the use of a consultant are given.

SULPHITE MILL ACID PLANTS

SULPHUR BURNING PLANTS
JENSSEN TWO TOWER ACID SYSTEMS
GAS COOLERS—SURFACE AND SPRAY TYPE
JENSSEN PRESSURE ACID SYSTEMS
JENSSEN AUXILIARY PROCESS TOWERS
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SOLUBLE BASE ACID PLANTS
SEMI CHEMICAL PLANTS
JENSSEN SO_2 ABSORPTION SYSTEMS

FOR BLEACH PLANT APPLICATION
SULPHUROUS ACID PREPARATION

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WATERTOWN, NEW YORK
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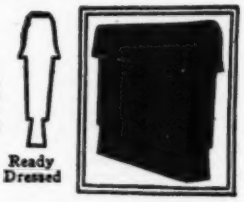
A. H. LUNDBERG, 308 Orpheum Building, Seattle, Washington
FOUNDED 1915

"READY DRESSED" MILL COGS
LABOR SAVING — TIME SAVING

The Most Economical Filling That Can Be Put in a Mortise Wheel.



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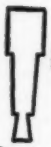

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THE N. P. BOWSHER CO., South Bend, Ind.

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Immediate opening for technically qualified sales engineer, familiar with alkaline pulping and all pulp and paper mill processes, to head promotion work at home office of leading manufacturer of industrial instruments. Occasional traveling. Location, New England. Graduate chemical or mechanical engineer preferred. Position permanent. Salary. Good company to work for; congenial associates. Send full particulars. Address: Box 512, The Paper Industry.

WANTED—Night Superintendent to take full charge of two-machine mill making sulphite and rag content papers. Must be experienced, aggressive, honest, dependable. In application, state complete details and references. Excellent opportunity for an ambitious man. Address: Box 513, The Paper Industry.

WANTED—Master Mechanic by large New England pulp and paper mill. State experience in detail in first letter. Address: Box 515, The Paper Industry.

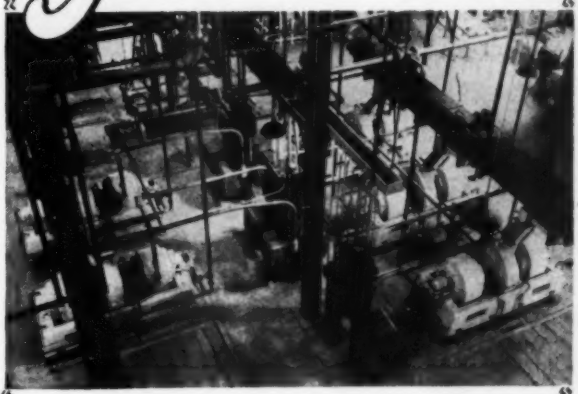
WANTED—Paper, any and all types, job lots, obsolete, damaged, misprints, etc. Also steel strapping and seals, etc. G. B. Goldman Paper Co., Dept. "C", 316 N. 3rd St., Philadelphia 6, Pa.

POSITIONS OPEN—MEN WANTED: Paper mill superintendent for cylinder and fourdrinier machines on wide variety papers; asst. gen. manager cylinder mach. specialty paper mill; supts. and foremen bag factories; machine foremen for cylinder and fourdrinier machine mills; salesman to sell mechanical equipment; master mechanics and plant engineers up to $10,000 a year, also designers and draftsmen for mills and firms building machinery; chemists and laboratory men; chemical engineer as group leader in research dept.; beater engineers; machine tenders and back tenders.

LIST YOUR CONFIDENTIAL APPLICATION WITH US
to keep informed of attractive positions
open in the pulp and paper mills.
CHARLES P. RAYMOND SERVICE, Inc.
294 Washington St., Boston 8, Mass.
Specialists in Placing Pulp and Paper Mill Executives

WANTED—Used vacuum washer, any size or construction considered. Phone Green Bay Paper & Pulp Co., Green Bay, Wis., Howard 8259.

Semichemical chips defibered by 5 Bauer Pulp Refiners



The above reproduction fails to do justice to one of the most spectacular commercial photographs we have ever seen. It was taken by Lefebvre-Luebke at the new mill of Green Bay Paper & Pulp Company, and is published by us with permission.

Here are five Bauer Pulp Refiners arranged in lines of three and two machines respectively. Semichemical chips are fed to the refiners through chutes. Each chute is equipped with a Bauer Permanent Magnetic Separator for removing tramp iron. Water is added to the chips by showers in the chutes to effect the desired consistency for fiberizing. Subsequent showers are used for further diluting the pulp.

This is an example of the hundreds of Bauer Pulp Refiners in operation throughout the world for pulp and stock processing. The materials treated include raw, steamed, extracted, or semichemically cooked chips; many types of screen rejects; raw pulp, old paper, straw, and numerous kinds of fibrous residues.

For complete information, read our bulletin No. P-1. A copy will be gladly sent upon request. Write, wire, or phone us.

Bauer

THE BAUER BROS. CO.

1759 Sheridan Ave. • Springfield, Ohio

In the Days of the
BEEF TRUST

Their figures were so spherical
Their actions so hysterical
So shocking to the clerical
But Oh, la la, so gay!

A nice one and a naughty one
A hefty one, a haughty one
About two hundred forty-one
Each girlie used to weigh.

The Fourdriniers were narrow trim
The cylinders were also slim
Unless our memories are dim
Their speed was tortoise-slow.

Today the Fourdriniers are wide
The multi-cylinders beside,
The web of paper seems to glide
As swiftly as a 'plane.

If you make paperboard or paper
Run slow, or fast — make no mistake a
Draper Felt makes smoother paper!
It does. Believe you me!

The DRAPER Felt

DRAPER BROTHERS COMPANY
Woolen Manufacturers Since 1856
CANTON, MASSACHUSETTS

MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

Quotations to consuming mills, cents per pound or dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Blue Overalls	16.00 to 16.50
Corduroy, Men's	5.75 to 6.00
Corduroy, Ladies'	5.75 to 6.00
Washables, No. 1	6.00 to 6.50
Percales	14.00 to 14.50
Light Prints, No. 1	13.00 to 13.50
Khaki Cuttings—	
Bleachable	11.50 to 12.00
Unbleachable	10.00 to 10.50
New White Canvas	24.00 to 25.00
Canton Flannels, bleached	24.00 to 24.50
Canton Flannels, unbleached	23.50 to 24.00
Shirt Cuttings—	
New White No. 1	24.00 to 25.00
White Shrunk	22.00 to 23.00
Silesias No. 1	14.50 to 15.00
New Unbleached	24.00 to 25.00
Fancy	11.00 to 11.50
Linen Cuttings—	
American	14.00 to 14.50
White	25.00 to 26.00
Grey	24.50 to 25.50

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing—	
No. 1	2.65 to 2.75
No. 2	2.55 to 2.65
No. 3 and 4	2.35 to 2.55
Twos and Blues—	
Repacked	4.75 to 5.00
Thirds and Blues—	
Repacked	4.25 to 4.50
Miscellaneous	3.75 to 4.00
Whites, No. 1—	
Repacked	5.50 to 6.00
Miscellaneous	4.50 to 4.75
White, No. 2—	
Repacked	4.50 to 4.75
Miscellaneous	3.75 to 4.00

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	8.00 to 8.50
Domestic	8.50 to 9.00
Wool Tares—	
Light	8.50 to 8.75
Heavy	9.00 to 9.50
No. 1 Scrap Bagging	7.00 to 7.50
Manila Rope—	
No. 1 large	6.50 to 7.00
No. 1 small	5.50 to 6.00
Sisal Rope—	
No. 1 large	6.00 to 6.50
No. 1 small	5.50 to 6.00
New Burlap Cuttings	8.50 to 9.00
Jute Threads—	
Foreign (Nom.)	7.50 to 8.00
Domestic	7.50 to 8.00
Strings—	
No. 1 sisal	5.50 to 5.75
No. 2 sisal	5.00 to 5.25
Soft jute	5.25 to 5.50
Mixed	3.50 to 3.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

Shavings—	per ton
Hard White Env. Cuts	225.00—
Hard White, No. 1	200.00—
Soft White, No. 1	175.00—
Soft White, one-cut	190.00—
Soft White, Misc.	150.00—
Fly Leaf, No. 1	95.00—
Fly Leaf, Woody No. 1	70.00—
No. 2 Mixed Col. Woody	60.00—
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	60.00—
Mixed Books	35.00—
Ledger Stock—	
No. 1 White	125.00—
No. 1 Mixed (Colored)	100.00—
Manilas—	
New Env. Cuttings	135.00—
New Env. Cuts, One-Cut	—
Extra Manilas	85.00—
Manila Tab Cards, Free of Ground Wood	150.00—
Colored Manila Tab Cards	115.00—
Kraft—	
New Envelope Cuttings	160.00—
Tripled Sorted No. 1 100%	110.00—
No. 1 Old Assorted	85.00—
News—	
White Blank	125.00—
Overissue	45.00—
No. 1 Folded	40.00—
Old Corrugated Container	65.00—
New Jute Corrugated Cuts	60.00—
Mill Wrappers	37.50—
Box Board Chips	35.00—
No. 1 Mixed Paper	35.00—

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—		
Lump, cwt.	4.05—	
Ground, cwt.	3.80—	
Powdered, cwt.	4.20—	
Blanc Fixe—		
Pulp, bulk, ton	90.00—	
Dry, barrels	95.00—	
Bleaching Powder—		
Drums, cwt.	5.00 to	6.00
Casein (Domestic Standard)		
20-30 mesh (bags), lb.		
80-100 mesh (bags), lb.	44.00 to	45.00
Argentine, lb.	40.50 to	41.00
China Clay—		
Domestic Filler Bulk (mine) ton	10.00 to	15.00
Domestic Coating Bulk (mine) ton	15.00 to	25.00
Imported (ship side) Bulk (lump) ton	22.00 to	30.00
Chlorine—		
Tank cars (wks) cwt.	2.80 to	3.05
Gelatine (silicin), lb.	1.25 to	1.35
Glyc. (C.P.) drums, lb.	.50 to	.55
Litharge, powd. bbl. lb.	.18¾ to	.20

Rosin (Gum)—	New York, per 100 lbs.
E	10.50—
F	10.50—
G	10.50—
WW	10.85—
Rosin (Wood), carlots, F.O.B. South	6.80—

MARKET QUOTATIONS

Salt Cake—		
Dom. bulk (wks) ton	22.00 to	24.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	25.00—	
Soda Ash—		
Bulk (works) cwt.	1.20—	
Paper bags, cwt.	1.50—	
Soda (Caustic)—		
Solid drums, cwt.	3.35 to	3.40
Ground and flake, drums, cwt.	3.75 to	3.85
Sodium Silicate—		
60 deg. 55 gal. drums, (works) cwt.	1.80 to	1.90
40 deg. 55 gal. drums, (works), cwt.	1.50 to	1.60
Starch—		
Pearl, 140 lb. bags, cwt.	5.92—	
Pearl, barrels, cwt.	5.92—	
Paper (Sp.) bags, cwt.	5.92—	
Powdered, barrels, cwt.	6.05—	
Sulphur (Crude)		
(Mine) bulk, long ton	22.00—	
Talc—		
Dom. 100 lb. bags (mine) ton	25.00 to	28.00
Canadian	35.00 to	45.00
Titanium Dioxide—		
Barium Pig. bbls., lb.	.21 to	.21½
Calcium Pig. bbls., lb.	.21 to	.21½
Zinc Sulphide, bbls., lb.	11.50 to	11.75

WOOD PULP

Prices, dollars per short, air dry, ton, with inland freight allowed, are:

Bleached sulphite, Swed.	175.00—
Bleached sulphite, Finnish	—
Bleached sulphite, dom.	135.00—
Easy bleaching sulphite	—
Unbleached kraft, Finn.	—
Unbleached sulphite, Swed.	153.00—
Unbleached sulphite, Fin.	—
Unbleached sulphite, dom.	140.00—
Unbleached kraft, Swed.	153.00—
Unbleached kraft, northern	140.00—
Unbleached kraft, southern	140.00—
Bleached sulphate, Swed.	180.00—
Bleached soda, domestic	140.00—
Sulphite screenings, dom.	40.00 to 50.00
Groundwood, domestic and Canadian	85.00 to 100.00

PAPER

f.o.b. New York City

Boards—	per ton
Binders	140.00—
Chip	105.00—
Chip, tube and can	115.00—
Chip, full blending	117.50—
Chip, sgl. mla. lined	130.00—
Coated, white patent .016	175.00 to 185.00
.020 and heavier	165.00 to 175.00
Kraft liner	125.00—
Filled News	107.50 to 110.00
Container	130.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)

Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	17.40—
B Grade E. F.	17.65—
A Grade S. C.	18.15—
B Grade S. C.	18.40—
No. 2 Uncoated Offset 4 sides, White	—
Machine Coated White	
No. 1 Glossy	23.40—
No. 2 Glossy	21.90—
No. 3 Glossy	21.15—
No. 4 Glossy	—
No. 2 Offset	17.90—
C1S Litho (Varnish)	—
C1S Litho (Non-Varnish)	—

Writing Papers—f.o.b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond—

(In Ton Lots)

	per cwt.
Extra 100% Rag	70.45—
100% Rag	62.45—
75% Rag	48.15—
50% Rag	38.90—
25% Rag	31.65—

Rag Content Ledger—

(In Ton Lots)

	per cwt.
Extra 100% Rag	72.65—
100% Rag	63.90—
75% Rag	49.40—
50% Rag	40.20—
25% Rag	33.00—

Sulphite Bond—

	per cwt.
Air dry, watermarked	—
No. 1 watermarked	19.05—
No. 2 watermarked	18.10—
No. 4 watermarked	17.10—

Sulphite Ledger—

	per cwt.
No. 1 watermarked	21.15—
No. 2 watermarked	21.00—
No. 4 watermarked	20.40—

Glassine (f.o.b. mill)—

	per cwt.
Embossed (25 lb. up)	—
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
Greaseproof—	
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—

News—

	per ton
Rolls, Standard (Contract)	106.00 to 110.00
Rolls (Spot)	(Nominal)
Sheets	—

Tissues (Carlots)—

	per ream
White No. 1	1.85—
White No. 2	1.65—
Bleached Anti-Tarnish	—
Colored	—
Anti-Tarnish Kraft	1.70—
Manila	1.85—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.90—
Napkins, full crepe and embossed (12½ lb. to M shts.) per cs.	.90—
Toilet, Bleached (M shts.) per cs.	7.10—
Toilet, Unbleached (M shts.) per cs.	6.05—

Towels

	per case
Bleached	6.65—
Unbleached	5.65—

Wrappings (Kraft)—

	per cwt.
Super-Standard	9.25 to 9.50
No. 1 Wrapping	8.25 to 8.50
Standard Wrapping	7.75 to 8.00
Standard Bag	7.50 to 7.75
Variety Bag	—

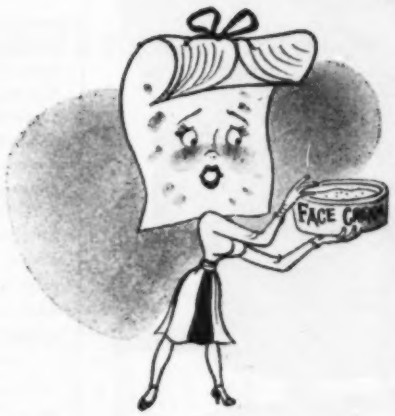
Wrappings (Sulphite and Bleached Kraft)— (Rolls, f.o.b. mill)

Bleached Papers—	per cwt.
M.F. & M.G. Waxing, 20 lb. (carloads only)	—
(10,000 lb.)	—
Drug wrapp., 35 lb.	—
Unbleached Papers	
Com. Gr. Butch. 40 lb.	
No. 1 Butchers	—
No. 1 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.	—
No. 2 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.	—
Steam Finish, 50 lb.	—
Water Finish, 50 lb.	—

Manilas—

Envp. Mla., Sub. 16-40 (No. 1)	—
Env. Mla., Sub. 16-28 (No. 2)	—
Envp. Mla. (Prices based on large sheets untrimmed ream marked, in bdls.)	—
Wrapp. Mla. 35 lb. up—	
No. 1	9.00—
No. 2	—
M.G. Sulphite and Kraft (other than Waxing)	
Grade B-20 lb.	—
Grade A-22 lb.	—

Does your paper's complexion need clearing up?



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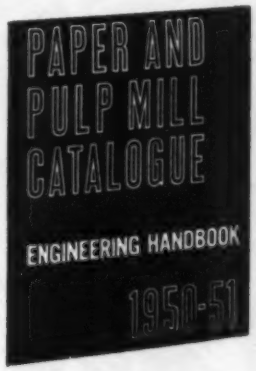

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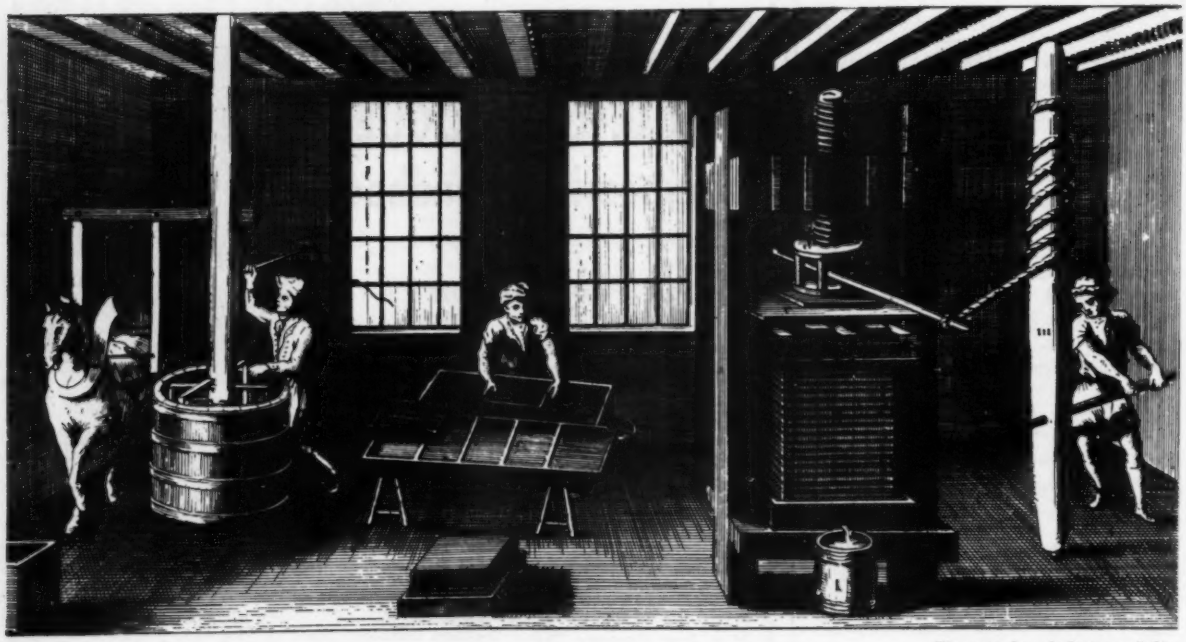

Illustration from the Bettmann Archive

When Paperboard was Made the Hard Way

Nearly two hundred years ago in France, heavy paperboard was used primarily for two purposes —for hat boxes and for the binding of books. The process of making the heavy paperboard from rags was shown in the above illustration in the French Encyclopedia, published by the Academy of Sciences in Paris in 1763.

It was sixty-five years later, in 1828, that G. A. Shryock developed at Chambersburg, Pa., a method of making paperboard from straw. "Many predicted," he wrote years after, "that these boards would become one of the indispensable products of the world." But straw was limited in its usefulness. Thirty-seven years later Benjamin Tilghman, a Philadelphia chemist, invented, in 1865, the sulphite process of manufacturing wood pulp. He was the first to see the far-reaching effect of this method in making plentiful paper possible. Such long, slow strides led eventually to the vast paperboard industry of today. Now paperboard is so extensively used for shipping containers and other purposes that it accounts for practically half the total production of the great pulp and paper industry.

The dramatic story of paper is told in the sound-and-color film, "Paper — Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request.

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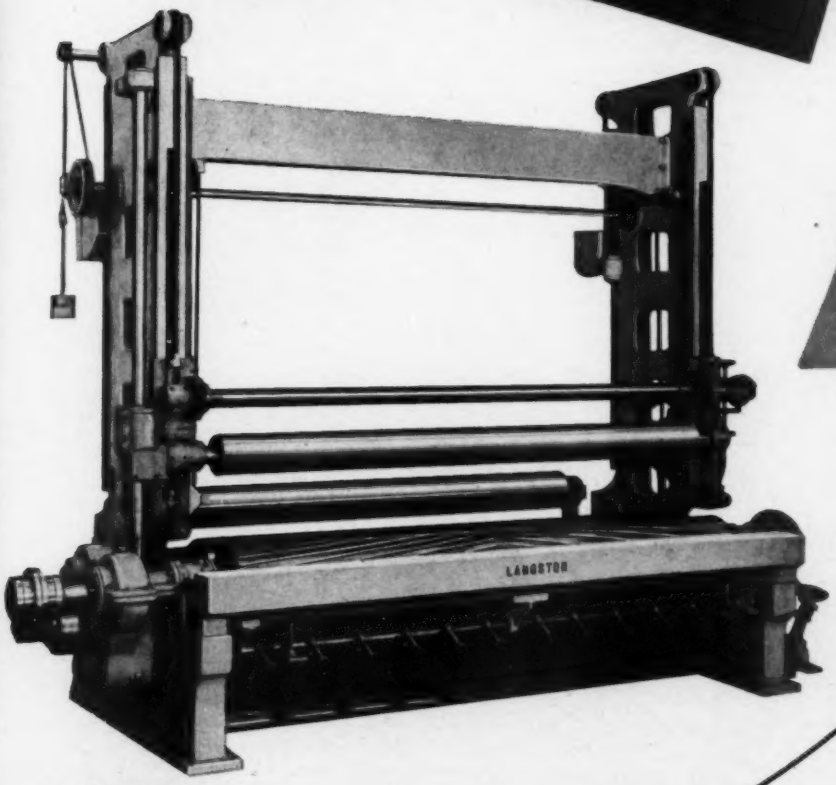

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(Cicero-De Oratore)

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